JAN 20 1927

33. No. 4. Medical (New Series. Published Quarterly). Winter, No., 1926

The Journal of Obstetrics and Gynæcology of the British Empire

Directors:
Sir FRANCIS H. CHAMPNEYS, Bart., M.D.
H. RUSSELL ANDREWS, Esq., M.D. T. WATTS EDEN, Esq., M.D.
W. BLAIR BELL, Esq., M.D. Sir EWEN JOHN MACLEAN, M.D.

Editor:
COMYNS BERKELEY, M.C., M.D.

CONTENTS.

C. G. Lambie, M.C., M.B., Ch.B. (Edin.), F.R.C.P. (Edin.), "Diabetes and Pregnancy." 563

Beckwith Whitehouse, M.S. (London), F.R.C.S. "A Contribution to the Pathology and Causation of Dysmenorrhœa. 607

G. W. Nicholson, M.A., M.D., B.Ch. (Cantab.), "Endometrial Tumours of Laparatory Scars." 620

Comyns Berkeley, M.C., M.D., (Cantab.), F.R.C.P., (London), "Why has the Teaching of Midwifery been so Inefficient?" 634

W. Blair Bell, B.S., M.D., (Lond.), "The Material and Methods of a Gynæcological and Obstetrical Clinic." 642

Douglas M. Lindsay, M.B., Ch.B., (Glasgow), F.R.F.P. & S. "Hæmorrhage from the Non-Gravid Uterus following Trauma." 648

Gerald F. Keaunge, M.A., M.D., B.Ch., (Dublin), "Two Cases of Precocious Puberty." 653

Comyns Berkeley, M.C., M.D., (Cantab.), F.R.C.P., (Lond.), "Endometrial Tumour of Laparotomy Scar." 657

Victor Bonney, M.S., M.D. (London), F.R.C.S. (England). "A Case in which Endometrial Tissue was Accidently Implanted." 658

Dorothy H. Douglas, L.R.C.P.I., L.R.S.C.I., and L.M, "Celluloid Jars for Mounting Permanent Specimens." 660

Current Literature 663

Reports of Societies ... ...

SHERRATT & HUGHES, MANCHESTER.

Price 12s. net. Annual Subscription, 42s. post free. Colonies and Abroad, 44s. post free. Published Quarterly.

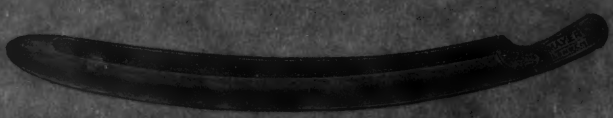
The Chiron Ring.

Elastic—Resilient—Light—Inexpensive. The 'Chiron' Ring Pessary is formed of a cushion of spongy rubber with a smooth surface. It has no metal spring, yet it gives the necessary support. It is lighter and more resilient than the ordinary watch-spring pessary and is in consequence more comfortable for the patient.

Made in 13 sizes, 2, 2½, 2¼, 2⅝, 2½, 2⅝, 2¾, 2⅞, 3, 3¼, 3½, 3¾, 3½.

Price 1/6 each, post free. Per dozen, 12/-

Special wholesale terms on application.



A Cervical Dilator.

For use during Cæsarean Section.

Devised by DANIEL DOUGAL, M.D. (Manchester). *vide* "Journal of Obstetrics and Gynæcology of the British Empire," Vol. 31, No. 2, 1924.

Whatever Operation Table you may select Buy one of British Manufacture.

The Empire Table

possesses advantages found in no other table. Its outstanding features are: Its rigidity—the method of obtaining the Trendelenburg position with perfect safety to the patient and—the Lumbar Bridge.

Full particulars on request.

Mayer & Phelps

CHIRON HOUSE,
59—61, New Cavendish Street,
LONDON, W.1

ESTABLISHED OVER 60 YEARS.

The Journal of Obstetrics and Gynæcology of the British Empire

VOL. 33. No. 4 (New Series). WINTER, 1926

Diabetes and Pregnancy.

By C. G. LAMBIE, M.C., M.B., Ch.B. (Edin.), F.R.C.P. (Edin.).

Assistant Physician, Royal Infirmary, Edinburgh; and Lecturer in Clinical Medicine, University of Edinburgh.

PART I.

GLYCOSURIA AND ACETONURIA IN PREGNANCY AND THE PUERPERIUM. *

THE presence of sugar or of acetone in the urine, at one time or another, during normal pregnancy and the puerperium is very frequently observed and, before dealing with diabetes mellitus, it is important to study the mechanism of the benign glycosurias and acetonurias and their relation to the more serious diseases.

Glycosurias of Pregnancy (1—4).

These may be classified as follows:—

1. Early alimentary glycosuria.
2. Renal glycosuria.
3. Lactosuria.
4. Late alimentary glycosuria.
   (a) Hypophyseal ?
   (b) Carbohydrate deprivation.

1. *Early alimentary glycosuria.* During the first three or four months of pregnancy a lowering of the assimilation limit for carbohydrate usually occurs, so that a diet rich in carbohydrate may readily give rise to glycosuria. (5—10). After ingestion of 50 grammes of glucose, the curve of blood sugar may rise to about 0.200 per cent. and show a delay in the fall (10—15). The glycosuria is due to hyperglycæmia and not, as has often been supposed (16—17), simply to a lowered renal threshold for glucose. Errors of interpretation have, in the past, arisen from the blood sugar having been estimated too long after the dose of glucose, thereby missing the height of the curve, which attains its maximum in about half an hour. Once the blood sugar has exceeded the level at which glycosuria occurs, sugar may persist in the urine for some time after the blood sugar has again fallen well below the original threshold. It is, therefore, fallacious to examine the urine

* Numbers in brackets refer to those in the Bibliography.

and blood simultaneously on a falling curve. The position of the renal glucose threshold requires further investigation. In some persons there appears to be a lowered threshold as well as a diminished sugar tolerance.

The cause of the diminished sugar tolerance is imperfectly known, but the following hypotheses suggest themselves: (1) That it is due to the absorption of substances from the products of conception, producing an effect analagous to that of infection or of the introduction of foreign proteins or products of partial protein hydrolysis into the organism. The period of diminished sugar tolerance coincides with that of placental development. During this period there is, as in the case of infection, increased protein catabolism, as shown by increased nitrogen excretion—this, in spite of the small needs of the embryo. The increased protein catabolism has been correlated with the secretion of proteolytic enzymes by the placenta, Graefenberg (18—19) having demonstrated the presence of these in the chorionic villi of the human placenta during the first three months of pregnancy. These ferments are less abundant during the fourth month and are no longer detectable by the fifth. It may be supposed that either the enzymes themselves or the products of partial protein hydrolysis resulting from their action, on being taken into the maternal circulation, are responsible for the altered sugar tolerance and the changes in protein metabolism. (2) That it is due to the internal secretion of the corpus luteum. This point has been investigated by Küster (20). After determining the sugar tolerance in a series of normal rabbits he found that, from the day of copulation, glycosuria could be produced by a dose of glucose administered by the stomach tube, which previously failed to do so. On the tenth day of gestation he removed the uterus from one half of the series and the ovaries from the other half, and found that the latter returned to normal in two days, while the former required five days. The quicker return to normal when the ovaries, instead of the uterus, were removed, suggested that the inhibitory factor was connected with the presence of the corpus luteum. It may be remarked however, that it is no easy matter to determine accurately the sugar tolerance of these animals, in view of the small numbers used and the ease with which glycosuria can be produced by such manipulative treatment as that to which they were subjected. Little reliance, therefore, can be placed upon these observations.

Though extracts of the ovaries of the non-pregnant animal containing the œstrus-producing hormone have been found to be physiologically antagonistic to insulin, in so far as they inhibit the sugar-reducing action of the latter in mice and rabbits, similar extracts of corpus luteum were found to be inactive (21). On the

other hand, extracts of placenta were potent (22—24), and this raises the question (3) as to whether the ovarian-like hormone of the placenta has any relationship to the diminished sugar tolerance. This hypothesis would not fit in so well with the fact that the diminished sugar tolerance is characteristic of the early rather than the later months, while the placental hormone is still present in quantity at term. Moreover, it remains to be proved whether the œstrus-producing and the insulin inhibiting substances in the extracts or, for that matter, the ovarian and placental "hormones" are one and the same. It would seem that the insulin-inhibiting action of the ovarian hormone has more importance in relation to the diminished sugar tolerance found just before the menstrual period in the human female and during œstrus in animals (25). (4) Finally, a contributory factor may be found in the unstable and excitable state of the nervous system during the early months of pregnancy, which, through splanchnic stimulation, might excite glycogenolysis in the liver.

The ease with which glycosuria is produced during the early months of pregnancy has formed the basis of attempts to utilize the phenomenon as a diagnostic test for pregnancy. Some observers have raised the blood sugar by ingestion of carbohydrate (26—32), others by injection of adrenaline (33—35); others, again, have facilitated the excretion of sugar following the rise in blood sugar by lowering the renal threshold with phlorizin (36). A negative result has some value, though not absolute, as glycosuria is not produced in a proportion of cases; a positive result is quite unreliable, as a lowered tolerance may result from many causes other than pregnancy. Adrenalin, when used alone, may, in any case, fail to raise the blood sugar if the liver contains too little glycogen (37), while the effective dose of phlorizin is too variable to render the use of the substance trustworthy (38—40).

2. *Renal glycosuria.* (41—46). This occurs in about 45 per cent. of normal pregnancies. Though a lowered renal threshold for glucose may be present at any time during pregnancy, it usually makes its appearance about the sixth or seventh month (47) and disappears towards the end of pregnancy or in the puerperium. Renal glycosuria is characterized by the presence of sugar in the urine in the absence of hyperglycæmia. Thus, whereas under ordinary conditions the average individual does not excrete sugar in quantity unless the blood sugar is above 0.17 per cent. (the renal "threshold" for glucose), the individual with renal glycosuria does so with a lower blood sugar, the fasting blood sugar being normal or subnormal. The amount of sugar in the urine is, as a rule, quite small, about 3 or 5 up to 10 grammes being excreted in the 24 hours, the percentage averaging about 0.2 to 0.3. Cases are on

record is which the excretion has been much greater (2.0 to 5.0 per cent.), but such are to be viewed with suspicion. The glycosuria is relatively uninfluenced by diet. This, however, depends upon the position of the renal threshold. When the lowering is slight, traces of sugar may appear only after meals rich in carbohydrate, and reducing the intake of carbohydrate, or giving it in such a form that it is slowly absorbed from the alimentary canal, may abolish the glycosuria. If the threshold be very low, sugar may always be present in the urine, even during starvation, and a greater excretion may occur after meals rich in easily assimilable carbohydrate. Provided that the utilization of carbohydrate by the tissues in general is good, increasing the amount of carbodrate in the diet does not increase the glycosuria to nearly the same extent as when there is a lowering of the assimilation limit for carbohydrate from any cause. The presence of a lowered renal threshold may, of course, co-exist with conditions in which there is a diminished capacity to store or to oxidize carbohydrate, *e.g.* alimentary glycosuria, diabetes mellitus. Here the lowered threshold, through causing a rapid excretion of sugar, tends not only to limit the hyperglycæmia and thus complicate the diagnosis, but, by depleting the tissues of carbohydrate, increases the acetonuria, so that, even when associated with simple alimentary glycosuria, it may give rise to minor acidotic crises (48—49). The amount of sugar in the urine in these circumstances may be large and there may be polyuria, thirst and pruritus. The diagnosis from diabetes mellitus may be different, but the condition is transient.

Simple renal diabetes does not call for any special treatment. In uncomplicated cases it causes no impairment of health nor is it associated with any of the classical symptoms of diabetes mellitus. The cause of the condition has not been determined. Labbé (*loc. cit.*) states that it can be abolished temporarily by the intravenous injection of calcium salts. This would suggest that it may be correlated with the demand of the fœtus for calcium during the later months of pregnancy.

3. *Lactosuria.* (50—54). Lactose, when introduced into the body parenterally, is not readily utilizable by the organism (55). It has also a lower renal threshold than glucose. For these reasons lactose, when it appears in the blood, is very rapidly excreted in the urine. Lactosuria is not uncommon during the puerperium [Williams (56) 4.6 per cent. of cases; Ney (57) 77 per cent.] and it may be present a few days before the birth of the child in women whose breasts contain much colostrum. It is more marked when the milk undergoes absorption through not being utilized, as when suckling is interrupted or when the secretion of milk exceeds the infant's demands. The origin of the lactose in the breasts is proved

by the fact that the condition is abolished or prevented when the mammary glands are removed (58—60).The concentration of lactose in the urine rarely exceds 0.3 per cent. Lactose is distinguishable from glucose by its being nonfermentable and yielding a characteristic osazone. It may also be recognized by special tests—Rubner's test and the Mucic acid test. Lactosuria has no pathological significance and does not call for treatment.

4. *Late Alimentary Glycosuria.*

Variety a. (*Hypophyseal?*)

This is a much rarer variety of glycosuria than any of the preceding. Like renal glycosuria, it usually appears about the fifth or sixth month and the two conditions may co-exist. It is characterized by a lowering of the assimilation limit for carbohydrate, together with glycosuria, which is often transitory or intermittent and disappears, as a rule, within ten days after delivery. The fasting blood sugar is usually normal or only slightly raised, but the blood sugar curve, after administration of 50 grammes of glucose, is abnormally prolonged and heightened. It sometimes happens that a rise in the renal threshold for glucose towards the end of pregnancy causes the glycosuria to disappear, masking a hyperglæmia. In mild cases, which are commonest the amount of sugar in the urine is quite small and the glycosuria is unaccompanied by polyuria, polydipsia, or any of the classical symptoms of diabetes. But in some instances it is much greater and, but for the rapid disappearance of the condition *post partum* and the relatively less marked symptoms, it would be very difficult, if not impossible to distinguish between it and diabetes mellitus. This is sometimes referred to as the "transient diabetes of pregnancy". It is said to be commonest in obese women (61). If the hyperglycæmia and glycosuria be very pronounced, they may, and for similar reasons, give rise to complications such as hydramnios, excessively large fœtus and acidosis, as in pancreatic diabetes.

Glycosuria of this variety may occur, often with increasing severity in successive pregnancies, particularly when these follow closely upon one another, and in some instances permanent diabetes mellitus supervenes (62—65).

The cause of the lowered assimilation limit for carbohydrate is not definitely known, but it is tempting to correlate it with the changes which occur in the endocrine glands during pregnancy. Both the thyroid and pituitary glands are enlarged, hyperplastic, and in a state of increased functional activity during the later months of pregnancy and undergo involution when pregnancy is over (66—67). An exaggeration of the activity of either of these glands, beyond the physiological limits natural to pregnancy,

might lower the assimilation limit for carbohydrate. Hyperthyroidism would do this by exciting glycogenolysis in the liver, thus interfering with the storage of carbohydrate. But none of the physical signs nor emotional phenomena of hyperthyroidism, are characteristic of the later months, even in patients with glycosuria, while the nitrogen excretion is diminished instead of being increased. It is very doubtful, therefore, whether the thyroid can be incriminated, though no doubt it is responsible for some cases.

There is no satisfactory evidence either on histological or physiological grounds for supposing that the suprarenal glands secrete too much adrenalin—the cortex of the gland rather than the medulla is hyperplastic (68).

Of more interest are the changes which occur in the pituitary body. This gland, during pregnancy, resembles an epithelial tumour and a milky juice may be squeezed out of it. The enlargement of the anterior lobe is due to the appearance, in large numbers, of a new type of cell, called "pregnancy cells" (69—70). These cells are large, with round or oval nuclei which do not stain deeply, while the cytoplasm contains granules which stain faintly with eosin. They are believed by Erdheim and Stumme to be derived from the chief or chromophobe cells, while Kraus (71) regards them as variants of the eosinophile cells. Regarding the kind of influence these cells may be expected to exert, according to the view of their origin, it may be mentioned that adenomata developed from chromophobe cells are usually associated with the hypopituitary syndrome in which alimentary glycosuria is absent (though impairment of carbohydrate metabolism may be demonstrated by intravenous injection of glucose) while those in which eosinophil cells predominate are associated with the hyperpituitary or acromegalic syndrome (72) in which a lowered carbohydrate tolerance with glycosuria is not uncommon, as in the early and active stage of acromegaly (73). It would therefore be imposible to anticipate from the histological appearances alone what the influence of the pregnancy cells upon carbohydrate metabolism would be. On the other hand, much interest attaches to the observation that signs resembling those of acromegaly may occasionally be met with during pregnancy. Erdheim and Stumme regarded the enlargement of the hands and lips occasionally observed, in this light. Marek (74) describes a case of what he calls "pregnancy acromegaly" in which, during two successive pregnancies, enlargement of the nose, fingers and toes, together with inability to approximate the teeth, developed and later subsided. Cushing also cites a case in which enlargement of the hands and feet occurred in three successive pregnancies prior to the establishment of acromegaly,

while Langdon Brown (75) has observed the development of diabetes mellitus in a woman who had acromegalic symptoms during pregnancy.

Löhlein (76) has recently made the observation that in about 80 per cent. of women approaching term there is a lateral narrowing of the visual fields, especially for red and green, and that the fields again become normal within ten days of delivery. The diminution in the size of the pituitary would therefore seem to synchronize with the disappearance of the glycosuria. The pregnancy cells disappear almost, but not quite, entirely after the termination of pregnancy, but with each succeeding pregnancy, especially if they follow closely upon one another, the number of cells remaining is augmented and the enlargement of the gland is correspondingly greater. (77—79). This would correspond to the increasing severity of the glycosuria in successive pregnancies, as already noted. Whether the glycosuria should be regarded as the result of abnormal secretion or of pressure upon the neighbouring parts of the brain is an open question.

Resemblances between the late alimentary glycosuria of pregnancy and that of acromegaly have not been clearly established, and failure to recognize the existence of simple renal glycosuria has often been a cause of confusion. Both are frequently intermittent or transitory and liable to spontaneous variation not occasioned by changes in diet, and both may in the long run be followed by diabetes mellitus (80—82). The blood sugar curves obtained in the two conditions are said to be similar and to conform to a specific type (83), but the evidence is unconvincing. Any of the phenomena described may be met with in mild pancreatic diabetes and there are at present no absolute criteria by which they can be clearly differentiated.

Increased activity of the posterior lobe of the pituitary is said to occur *pari passu* with the involution of the corpus luteum near term and to be a cause of the onset of labour (84). Although pituitrin antagonises insulin, in so far, at all events, as it prevents the fall of blood sugar caused by the latter (85—86), the late occurrence of this hyperactivity renders it improbable that it has anything to do with the glycosuria we are considering.

The pancreas does not seem to exhibit any important changes during pregnancy. Falco (87), Sertori (88) and Aron (89) believe that they can detect histological changes of a degenerative character and diminution in the amount of islet tissue, but the opposite findings are reported by Pepere and by Ciulla (90). Allen (91) examined microscopically portions of pancreas removed during various stages of pregnancy and lactation in the bitch and discovered no departure from the normal. This probably represents

the truth of the matter. It is difficult, however, to draw conclusions regarding the functional state of an organ from histological evidence alone.

On the whole there is much to be said in favour of the hypophyseal origin of the glycosuria, but the possibility of there being a temporary functional pancreatic insufficiency cannot be excluded.

In healthy women the carbohydrate tolerance during the last half of gestation, as ascertained by blood sugar curves, is normal (92). The establishment of some sort of equilibrium among the various glands influencing carbohydrate metabolism, or the utilization of carbohydrate by the fœtus, and, more doubtfully, the supplying of insulin to the maternal organism from the fœtal pancreas (*vide seq.*) may contribute to produce this result.

Variety b. Note should be taken of a mild type of glycosuria occasionally met with in the later months of pregnancy, characterized by the fact that it disappears or diminishes in a day or two if the intake of carbohydrate be increased. The usual lowering of the renal threshold for glucose may prevent its complete disappearance. While the condition lasts, there may be slight hyperglycæmia and an abnormally heightened and prolonged blood sugar curve may be obtained. A similar type of glycosuria may be met with, apart from pregnancy, in persons who have been living on a diet very low in carbohydrates. It is possible that in pregnancy the condition is occasioned, not necessarily by diminished intake of carbohydrate, but by the increased demands of the fœtus for this material (*vide seq.*). No importance is to be attached to this type of glycosuria beyond the recognition of its innocent nature. Apart from it, however, the occurrence of a diminished carbohydrate tolerance in the later months would seem to constitute a departure from the normal the benign character of which must be viewed with suspicion.

Acetonuria in Pregnancy. Acetonuria, like glycosuria, is very common in pregnancy. The older observers—Stolz (93) and Bar (94)—noted it in some 30 per cent. of cases, but the proportion would probably be found to be greater were the more delicate tests now available employed. Porges and Novack (95) showed that, in normal pregnant women, acetonuria could always be produced by a special diet which did not lead to the excretion of acetone bodies in non-pregnant women. This acetonuria could be produced most readily between the sixth and seventh month and term; it was much less frequently present in the earlier months, though it was occasionally noted in the second and third months. It rapidly disappeared after the birth of the child.

Acetonuria in pregnancy, as in other conditions, is due to a disproportion between the amounts of fat and sugar undergoing simultaneous combustion within the body. The fats are said to "burn in the fires of the carbohydrates" and acetonuria appears whenever the proportion of fatty-acid-yielding substances to glucose-yielding substances actually catabolized exceeds a ratio in which one gramme molecule of glucose burns along with one gramme molecule of fatty acid. Taking the molecular weight of glucose as 180 and the mean molecular weight of the fatty acids in body-fat as 270, the optimum ratio, expressed in grammes, would be :—

$$\frac{\text{Fatty Acid}}{\text{Glucose}} = \frac{270}{180} = 1.5$$

Forty-four per cent. of protein and ninety per cent. of fat are capable of yielding fatty acid within the body. Since fatty acids are ultimately oxidized to acetoacetic acid which, when excreted in the urine is converted into the ketone, acetone, they are said to be ketogenic. On the other hand, a hundred per cent. of assimilable carbohydrate, fifty-eight per cent. of protein and ten per cent. of fat furnish glucose in the organism and are therefore antiketogenic. The total glucose yielded is referred to as G. Briefly :—

$$\frac{\text{Ketogenic}}{\text{Antiketogenic}} = \frac{44P + 90F}{100C + 58P + 10F} = \frac{\text{Fatty Acid}}{\text{Glucose}}$$

and this ratio should not exceed 1.5 if acetonuria is to be prevented.

Acetonuria would seem to be specially liable to occur when there is a disproportion between the amounts of carbohydrate and fat available for combustion in the liver itself, as when glycogen formation is interfered with or when fatty infiltration occurs in the organ.

Apart from diabetes mellitus, which will be discussed separately, acetonuria in pregnancy may be most conveniently considered according to the time at which it occurs.

Acetonuria in the early months.

Causative factors.

(a) Starvation.
(b) Lowered carbohydrate tolerance.
(c) Deposition of glycogen in the placenta.
(d) Nervous influences causing glycogenolysis.

Starvation, associated with excessive vomiting, anorexia, or capricious appetite, causes the optimum fatty acid—glucose ratio to be exceeded because, not only is the carbohydrate intake low,

but there is increased breaking down of body-fat to meet the energy requirements of the individual. Harding (96) points out, however, that acetonuria may readily occur apart from undernutrition and he suggests that it is due to deficiency of liver glycogen caused by the laying down of glycogen in the placenta. He attributes the nausea and morning sickness of these months to the ketosis and states that they can be abolished by a diet rich in carbohydrates. He makes the suggestive observation that the symptoms referred to usually occur at the time of day corresponding to the longest interval after a meal. It may be doubted, however, whether the mild ketosis is sufficient to account for the symptoms.

Further factors tending to produce acetonuria are the lowered sugar tolerance of the early months, whose causes have already been discussed, and nervous changes exciting glycogenolysis.

Acetonuria in the later months.

Causative factors.

A. Normal

(a) Demands of the fœtus for carbohydrate.
(b) Loss of glucose due to diminished catabolism of amino-acids.
(c) Mobilization of fat; fatty infiltration of the liver.

B. Pathological.

(a) Late alimentary glycosuria.
(b) Very marked renal glycosuria.
(c) Deficiency of glycogen in the liver, due to poisoning in toxæmias of pregnancy.
(d) Starvation in pernicious vomiting and other toxæmias of pregnancy.

It might be thought that acetonuria in the later months could result from relative starvation of the mother owing to the caloric demands of the fœtus. This, however, is improbable, as the basal energy metabolism of the pregnant woman in the last month of pregnancy is only some 4 per cent. greater than in the non-pregnant woman (98) and the caloric intake is usually much more than sufficient to meet the energy demands of both mother and child.

It is commonly supposed that the acetonuria is due to "liver insufficiency," the result of toxæmia or of the "strain" thrown upon the organ during the later months, leading to impairment of its power to store glycogen. This explanation is admissible in the case of those major toxæmias of pregnancy in which undoubted hepatic lesions are present, though even here the vomiting and consequent starvation would seem to be mainly responsible for the

ketosis (99); but no satisfactory evidence has been adduced in support of this hypothesis as applicable to the normal pregnant woman. In the first place, we may set aside evidence as to glycogen deficiency based upon histological examination(100—101) or upon chemical examination of the liver, made some time after death, owing to the rapidity with which *post mortem* glycogenolysis takes place. Reports as to the glycogen content of the liver of pregnant animals are conflicting, some experimenters finding a high (102—103) and others a low content, but this would seem to mean that the glycogen varies within normal limits.

The character of the blood sugar curves obtained in the later months does not suggest the existence of an impaired capacity for storing carbohydrate, unless the latter be masked by an extraordinarily rapid transfer of carbohydrate to the fœtus. Gottschalk (104), however, employing the lævulose test, found that the blood sugar rose above physiological levels in nine out of twenty (45 per cent.) cases examined between the fifth and the ninth month. But the precise significance to be attached to the lævulose test as a guage of hepatic function is still undetermined. It is possible that the liver cells may retain the power to convert glucose into glycogen and yet be unable to change the lævorotatory hexose, lævulose, into its dextrorotatory isomeride, glucose.

Crainicianu and Popper (105) and Didier and Philippe (106) have found the hæmoclastic crisis test positive in about 33 to 45 per cent.of pregnant women. But here, again, there is no necessary connection between this phenomenon and inability to store ingested carbohydrate as glycogen.

All liver function tests do not agree in showing disordered function, for no departure from the normal is discoverable in healthy pregnant women by means of the phenoltetrachlorphthalein test (107—108).

Since there is no satisfactory evidence of liver inefficiency during normal pregnancy, it seems desirable to enquire whether the disturbance of the ketognic: antiketogenic balance can be accounted for on physiological grounds, instead of having recourse to assuming the existence of unknown toxins.

We have seen that acetonuria can be brought about by insufficient *intake* of carbohydrate. Is it possible that, in pregnancy, the altered balance is due to excessive *removal* of carbohydrates by the fœtus, giving rise to a corresponding deficiency in the maternal tissues? In the fœtus, carbohydrate may be:—

(a) Stored as glycogen or

(b) Burned up for the supply of energy.

In the human fœtus, the liver begins to assume its glycogenic function about the fourth month of gestation, at which time the

islets of Langerhans also begin to develop (109). During the latter half of pregnancy, large quantities of glycogen are laid down, not only in the liver, but in all the tissues of the fœtus (110), the amount deposited averageing , in the rabbit, 6.3 grammes *per* kilo *per diem,* while towards the end of gestation the rate of deposition is even greater (111). If the figures for the human being are at all comparable it would mean that for a fœtus approaching term, of weight say 3 kilos, more than 19 grammes of glycogen would be deposited daily.

Not only does the fœtus store large quantities or carbohydrate, but there is evidence that carbohydrate constitutes the main, perhaps the exclusive, source of energy for the active metabolism of the fœtus. Thus, Bohr, (112) examining the oxygen and carbon dioxide content of the umbilical artery and vein of the fœtal guinea-pig, found the respiratory quotient of the latter to be approximately unity, indicating that carbohydrate was the chief material undergoing combustion. Similar results were obtained by Cohnstein and Zuntz (113) in the case of the sheep embryo. Hasselbalch (114) and Bailey and Murlin (115) investigated the respiratory exchange in the new-born and found that here, also, the respiratory quotient was unity. This, however, might be regarded, not merely as a continuation of the type of metabolism present *in utero,* but, more probably, as the result of the utilization of the material most available for combustion at the time, namely, the glycogen which had been stored in the tissues. Here, also, the influence of hyperglycæmia, associated with labour and the administration or anæsthetics, cannot be overlooked, since Morriss (116) has shown that the level of blood sugar in the umbilical vein may rise *pari passu* with that of the maternal blood.

A respiratory quotent of unity has also been found to obtain in the case of minced embryonic tissue *in vitro* (117).

If it be admitted that the energy metabolism of the fœtus is derived from the combustion of carbohydrate, that is, from the most easily diffusible of foodstuffs and the one which passes most readily through the placenta, then, if we could estimate the total metabolism of the fœtus, an approximation could be made to the amount of carbohydrate thus utilized.

Pflüger (118) on *a priori* grounds, came to the conclusion that the metabolism of the fœtus must be insignificant as compared with that of the mother; but this has since been definitely refuted. A study of the metabolism of developing tissue, from a variety of sources (119—125), indicates that the energy required for development is considerably greater than that necessary for maintenance in the adult organism. Direct determination of the metabolism of the human fœtus is, of course, impossible, but some information

may be obtained by estimating the total metabolism of mother and child during pregnancy. Thus, Zuntz (126) using the Zuntz-Geppert method for determining the respiratory exchange, found that about the middle of pregnancy a definite rise in the respiratory volume could be demonstrated and that this progressively increased towards the end of gestation. Contrary to expectation, it was not due to increased frequency but to an increase in the depth of respiration. By the end of pregnancy the respiratory metabolism was much greater than in the same individual in the non-pregnant state. This Zuntz ascribes partly to the increased labour of respiration, but, after allowing for this factor, it was found to be proportional to the increase in weight of the mother. Minor fluctuations could be accounted for by changes in the weight of the mother (increase or loss of fat), apart form the products of conception. It follows from this that the metabolism of the fœtus *plus* the accessory structures—liquor amnii, placenta, and membranes can be treated as so much maternal tissue. But, since the liquor amnii, and possibly the membranes, take little if any part in the metabolism, the increase must be ascribed to the fœtus and the uterus. If the metabolism of the latter be reckoned along with the remainder of the maternal tissues, it is evident that the metabolism of the fœtus, reckoned on the basis of body weight, must be greater than that of the mother to an extent just sufficient to compensate for the dead weight of the liquor amnii and membranes.

If we calculate the metabolism of the fœtus on this basis, the following results are obtained. Suppose the weight of the mother to be 50 kilos and that it remains unaltered, apart from the uterus and its contents, and that the increase in weight due to the latter (taking average figures) is made up as follows :—

Uterus	1000	grammes
Placenta	600	,,
Amniotic fluid	600	,,
Fœtus	3000	,,
Total	5200	grammes

then, taking 24 calories *per* kilo *per* 24 hours as the average metabolism of the individual at absolute rest :—

50 kilos at 24 calories *per* kilo =	1200	calories.
Increase due to uterus and contents	124.8	calories.
Increase due to fœtus, amniotic fluid, and placenta, after subtracting 24 calries *per* kilo for uterus	100,8	calories.

Since the metabolism of the amniotic fluid and possibly the membranes is negligible, the metabolism of the fœtus would work out at between 29 (*i.e.* supposing the placenta to use 24 calories *per* kilo) and 32.2 calories *per* kilo *per* 24 hours, or, 1.2 to 1.4 calories *per* kilo *per* hour, instead of 1 calorie *per* kilo *per* hour as in the adult. Expressing the energy metabolism in terms of carbohydrate, 25.2 grammes of carbohydrate would be used in producing 100.8 calories.

These figures rest upon the assumption that the increase in respiratory volume is largely due to the increased labour of respiration, which is uncertain. It might reasonably be supposed that the respiratory muscles work under difficulties owing to the abdominal distension in the later months of pregnancy. Estimations of vital capacity (127), however, show very little diminution, while Carpenter and Murlin (128) confirm Zuntz's observation that the respirations are not more shallow or more frequent than normal. The respiratory centre, therefore, appears to be stimulated in a specific way, probably by CO_2 from the fœtal metabolism and perhaps rendered more sensitive owing to the decrease in available base in the blood plasma which is normally met with in pregnancy (129—133). If the relative increase in the metabolism be due to the fœtus and not to the increased work of the heart and muscles of respiration, the heat produced by the former would be a great deal more than sufficient to offset the dead weight of the accessory structures which take no part in the metabolism. Carpenter and Murlin (*loc. cit.*), using the respiration calorimeter, found the energy metabolism, expressed *per* kilogramme and hour, in the last month of pregnancy to be about 4 per cent. greater than for the woman in complete sexual rest; reckoned in terms of body surface, it is more than 7 per cent. greater, in spite of the fact that the amount of surface in proportion to weight is relatively less than in the non-pregnant adult. If, now, we ascribe the increased metabolism to the products of conception and suppose any change in that of the heart and muscles of respiration to be negligible, the following results would be obtained:—

50 kilos at 24 calories *per* kilo.	1200	calories
55.2 kilos at 25 (i.e. +4%) cals. *per* kilo.	1380.6	calories
Difference	180.6	calories
Uterus 1 kilo at 24 cals. *per* kilo.	24.0	calories
Metabolism of fœtus and placenta	= 156.6	calories

The metabolism of the fœtus works out at between 47.4 and 52 calories *per* kilo *per diem* or 1.9 to 2.17 calories *per* kilo *per* hour, while the carbohydrate equivalent of the energy consumed would

be 39 grammes. These figures appear rather too high in view of the fact that they make the metabolism of the fœtus *in utero* at the temperature of the mother fully equal to that of the newborn child at room temperature. It may be remarked, however, that the metabolism of the newborn child does not change in response to alterations in external temperature in a manner comparable to the adult, crying being the main activity bringing about increased heat production when the external temperature is lowered. Moreover, the figures given by Benedict and Talbot and by Bailey and Murlin for the metabolism of the newborn (*vide seq.*) apply to infants exposed to an external temperature approximating to body temperature. It is therefore of interest to approach the problem from another angle. Murlin (134), comparing the energy production at the culmination of pregnancy in the dog with that of the same animal in sexual rest, found that the extra metabolism of the pregnant organism was proportional to the weight of the newborn and was just about equal to the requirements of the newborn alone under conditions of muscular rest and at the ordinary room temperature. In other words, the energy production of both together suffers no deflection at birth. Carpenter and Murlin (*loc. cit.*) confirmed this regarding the human subject by direct determination of the energy metabolism of mother and child together, before and after parturition, in the respiration calorimeter. Evidently, therefore, the metabolism of the uterus, placenta, etc., would be just equivalent to the difference between the metabolism of the newborn at room temperature and that of the fœtus at the temperature of the mother's body. Benedict and Talbot (135) and Bailey and Murlin (*loc. cit.*) find that the average heat production for infants over 4 kilos in weight and between one and seven days old is 1.75 to 1.85 calories *per* kilo *per* hour, while the average of all those between 2.7 and 3.0 kilos and within the same range of ages is 2 calories *per* kilo *per* hour. The metabolism for the first twelve hours after birth is, however, about 15 per cent. lower than for the rest of the first week. For a child of 3 kilos, therefore, the metabolism at birth would be about 1.7 calories *per* kilo *per* hour or 40.8 calories *per* kilo *per* diem, giving a total of 122.4 calories in the 24 hours. But we have seen that the metabolism of the child *in utero, plus* the uterus and membranes would be equivalent to this figure. Subtracting 24 calories, as before, for the uterus, 98.4 calories would represent the metabolism of the child and placenta—a very close approximation to the figure obtained on the basis of Zuntz's findings. The metabolism of a fœtus 3 kilos in weight would, therefore, appear to be between 100 and 150 calories *per diem*, but we shall adopt the lower of these figures for our present purpose as it would represent a minimum.

We have now to consider whether any further loss of available glucose is involved in the changes which occur in protein metabolism in pregnancy. Although the amount of extra protein formed is relatively insignificant, amounting to only 3 grammes *per diem* for the fœtus, and about 2 grammes for the uterus, breasts and placenta, the nitrogen retention is much greater than would be accounted for by protein synthesis. This nitrogen retention has been found to obtain throughout the second half of pregnancy in the dog, (136—137), while, towards the end of pregnancy, in the human subject, there is a daily retention of nitrogen ranging from between 2.0 and 7.5 grammes and averaging 5.0 grammes *per diem.* (138—142). The diminished excretion of nitrogen affects chiefly the urea and is not accounted for by any change in the ammonia urea ratio. Simultaneously, there is a slight increase in the excretion of amino-acids. This means that the amino-acids derived from the protein in the food, instead of being deaminized in the liver to the same extent as in the non-pregnant state, fails to split up into their nitrogenous and their energy-yielding components and are either stored in some other way or excreted in the urine. Treating the amino-acids thus retained after the same fashion as those in protein as regards their ketogenic and antiketogenic properties, the amount of glucose equivalent to 5 grammes of amino nitrogen would be 17.36 grammes and the amount of fatty acid 13.6 grammes. Hence there would be a slight relative loss of antiketogenic material amounting to about 4 grammes *per diem.*

We are now in a position to calculate the total loss of glucose sustained by the mother and to study its effect upon the ketogenic : antiketogenic balance. For a child of 3 kilos in the ninth month of gestation it would be made up as follows :—

Deposition of glycogen at 6.3 grammes *per* kilo	19	grammes
Oxidized by fœtus	25	,,
Retained as amino-acid	4	,,
Total	48	grammes

As the figures are minima, we may safely compute the carbohydrate "drain" at, roughly, 50 grammes *per diem.*

In the case of a pregnant diabetic woman (*vide seq.*) at the beginning of the ninth month, with the glycosuria completely controlled by means of insulin, it was found that a fish diet furnishing 2268 calories, $\frac{1}{1}$ ratio, made up of $\frac{\text{Fatty acid } 189}{\text{Glucose } 189}$ was necessary to keep the urine acetone free. With a diet of such caloric value,

the average non-pregnant diabetic can easily tolerate the optimum ratio, namely $\frac{1.5}{1.0}$. At term, a child weighing over four kilos was born. It may therefore be safely assumed that the weight of the fœtus at the beginning of the ninth month was not less than 3 kilos; but we shall adopt the latter weight as a minimum. It is clear that if we subtract 50 grammes of glucose from 189 grammes in the diet, the ratio becomes $\frac{\text{Fatty acid } 189}{\text{Glucose } 139}$ or $\frac{1.42}{1}$. Hence, the addition of 15 to 20 grammes of fatty acid to the diet, or, raising the ratio from $\frac{1}{1}$ to $\frac{1.1}{1.0}$, would render acetonuria theoretically possible, for the balance would now exceed the optimum ratio, and this was actually found to be the case.

Considering that the estimated carbohydrate drain represents a minimum, the explanation here offered of the disturbed ketogenic; antiketogenic balance in pregnancy seems to be a feasible one. It would account satisfactorily, not only for the tendency to ketosis in the normal, but for the fact that ketosis is much more difficult to control in the pregnant than in the non-pregnant condition. In an ordinary mixed diet, the ratio of antiketogenic to ketogenic materials is usually sufficient to keep the balance within physiological limits; but insufficient food, too little carbohydrate, or too much fat would readily cause these limits to be trespassed in the later months of pregnancy. That the disturbed balance should begin to manifest itself about the sixth month and become gradually more marked is accounted for by the fact that only after the sixth month has the fœtus any appreciable weight and hence energy-metabolism as compared with the mother (143), while the glycogenic function of the fœtal liver and the nitrogen retention in the mother are only manifest during the latter half of pregnancy.

The possible bearing of changes in the fat metabolism upon the ketogenic; antiketogenic balance remains to be considered. In the later months of pregnancy the blood contains about 30 per cent. more fat than in non-pregnant women (144), while fatty infiltration of the liver is the rule both then and early in lactation (145). It is suggested by Leathes and Raper (146) that this is due to the increased activity of the pituitary, the effect of pituitrin, according to Coope and Chamberlain (147), being to mobilize the fat in the stores in adipose tissue and cause its deposition in the liver. But this would assume a very early activity on the part of the posterior lobe of the pituitary and one cannot overlook the possibility that the changes in fat metabolism may, in part, if not chiefly, be secondary to those in carbohydrate metabolism. Whether the increased mobilization of fat is

accompanied by increased catabolism is unknown. If it were, it would be a further factor tending to raise the ketogenic; antiketogenic ratio, especially within the liver itself. It is possible, however, that a transference of stored fat from the mother to the fœtus may occur without any oxidation of the fat that is in transit. The fat in the fœtus is much increased during the later months of gestation and there is evidence to show that some of it may come from the maternal blood across the placenta (148); but the disparity between the fat content of the maternal and fœtal blood and the lack of parallelism between the two suggests that fat does not pass through the placenta in a manner comparable to glucose and other readily diffusible substances (149). Neutral fat does not seem to pass through the placenta, as Daniels and Mendel 150) found a sharp line of demarcation in the placenta between stained and unstained fat in pregnant animals, using Sudan III. The placenta, if it does normally transmit fat, would therefore seem to convert it first into fatty acids and glycerine. Hofbauer's evidence of fat transmission is based upon the finding of a foreign fatty acid—laurinic acid—in the fœtuses in guineapigs fed on coconut oil and it is doubtful whether this should be accepted as satisfactory evidence of normal transmission. If the transference of fat across the placenta be regarded as somewhat doubtful, the fat of the fœtus would have to be synthesized from carbohydrate and protein. This would constitute a further demand for glucose which has so far been ignored.

Under pathological conditions, acetonuria in the later months may be much increased by excessive loss of sugar in the urine in connection with various glycosurias met with at this period. Excessive vomiting, whether of nervous or of toxic origin, may also give rise to starvation ketosis. In some of the toxæmias of pregnancy, the liver may be unable to form glycogen, in which case acetonuria would readily occur.

Acetonuria during labour and immediately afterwards.

Causative factors.

(a) Depletion of carbohydrate reserves due to muscular activity during parturition.
(b) Anæsthetics.
(c) Starvation.
(d) Hæmorrhage.
(e) Sepsis.

Acetonuria is present during over 90 per cent. of normal labours and immediately afterwards (151—152). It is due mainly to the

excessive using up of carbohydrates, with depletion of the carbohydrate reserves of the body, during the muscular activity incidental to parturition, and it is therefore most marked in difficult and prolonged labours. Other factors contributing to the ketosis are the administration of anæsthetics, which excite glycogenolysis, and abstention from food.

Excessive hæmorrhage and septic infection also cause glycogenolysis and may aggravate a ketosis.

Though pituitrin, owing to its antagonism to insulin, might be expected to have some influence upon ketonuria, it does not appear to have any action of consequence in this connexion, at all events when given in the usual doses for obstetrical purposes.

Lactation.

The influence of lactation upon the ketogenic : antiketogenic balance requires investigation.

Human milk contains 4.2 per cent. of total fatty acid and 7.84 per cent. lactose. The secretion of milk would therefore involve a relative loss of antiketogenic material, which, for 400 cc. of milk would amount to about 14 grammes. Acetonuria might, therefore, be expected to occur with slightly greater readiness than normally. The large amount of fat excreted in the milk, accompanied by disappearance of the fatty infiltration of the liver and the return of the blood fat to normal, within a few days of parturition, may prevent the balance from being much disturbed.

PART 2.

Diabetes and Pregnancy.

Blot (153) was the first to show that a physiological glycosuria may occur in pregnancy and lactation, and when Hofmeister (154) demonstrated that the sugar commonly found by him was lactose, the view became current that true diabetes did not occur in pregnancy, until Matthews Duncan (155) collected 22 cases of the disease. The association of diabetes with pregnancy is, however, uncommon, on account of the unfavourable influence which diabetes exerts upon the reproductive functions (156—173).

Influence of Diabetes upon Fertility and Menstruation.

Whether as the result of the impaired nutrition of the tissues or through lack of the physiological stimulus of the pancreatic

hormone, diabetes gives rise to a functional disturbance of ovulation, and, in long standing cases, to atrophic and sclerotic changes in the ovaries and uterus (174—187). Associated with these changes, there may be sterility, disturbances of menstruation, sexual frigidity (188—190), and, in some cases, obesity.

Menstruation is absent in about 50 per cent. of diabetics and disturbed in 65 per cent. (191).

Not more than 1 to 5 per cent. of diabetic women become pregnant, and, according to some (192) the percentage is even smaller. Von Noorden reports 5 per cent of pregnancies in 427 diabetic women who were in the child-bearing period, and Wiener (193) in the Vanderbilt clinic, states that only one out of 28 become pregnant. Though conception is less frequent in the more severe cases, the incidence of sterility runs parallel with the chronicity of the disease rather than with its severity.

'Reports are already available which indicate that the treatment of the diabetic condition with insulin may in some cases restore the reproductive functions. Thus, Joslin, Root and White (194) state that, whereas no girl in their experience menstruated when diabetes had preceded puberty, four cases began to menstruate for the first time after the administration of insulin. Allen and Sherile (195) have also recorded the onset or recurrence of menstruation under insulin treatment, while Fitz and Murphy (196) cite the case of a young woman with diabetes who, after two years of amenorrhœa, had a return of the catamenia and finally became pregnant. The occurrence of pregnancy in completely depancreatised experimental animals treated with insulin has also been noted (197).

As menstruation and fertility do not return in some individuals in spite of the efficient control of the diabetes, the administration of insulin and the good general condition of the patient, it may be inferred that, in these cases, organic changes have occurred which render the return of these functions impossible.

Since only a small number of cases of diabetes in pregnancy treated with insulin have been recorded (198—203), and none in detail, the observations made upon the following case may be of interest.

Case:—Mrs. B. Primigravida. Age 32. Married 1921. Enjoyed good health until the present trouble. She suffered a little from dysmenorrhœa, but menstruation was regular and normal in amount up to the time of her pregnancy. Her brother died of diabetes at the age of 30. She had been of slim build until 1923 when she became rather stouter. Her pregnancy commenced in July 1925 (last menstruation began 2nd or 3rd July and ended 8th July), and during the first four months she remained apparently

well, there being very little morning sickness and never any vomiting. About the beginning of December, she began to feel weak and easily fatigued while, a little later, there was slight thirst; but this she attributed to her condition. On December 20th her husband, who happened to be an analytical chemist by profession, noticed an odour of acetone in her breath and this led to the examination of her urine for the first time. It was found to be loaded with sugar and acetone. The sugar was proved by the phenylglucosazone test to be glucose. On December 23rd she came to Edinburgh and was admitted to a nursing home. She was placed on a diet containing 1510 calories, 124 grammes of total glucose and having fatty acid : glucose ratio of 1 : 1. On this diet, she excreted 24 grammes of glucose in 24 hours, the concentration in the urine being 3 per cent. On the succeeding two days the diet was reducd first to 1244 calories, 102 grammes glucose, and then to 909 calories, 76 grammes total glucose. The fasting blood sugar on the third day after admission was 0.119 per cent., but the 24 hours urine still contained 0.75 per cent. of sugar, giving a total output of 14 grammes. After further reduction in the diet, and a starvation day, the urine became sugar free, but the acetonuria became alarmingly marked. She was given alkaline sodium phosphate to aid the elimination of acid by the urine, and the carbohydrate in the diet was gradually increased; but sugar reappeared in the urine total glucose 61 grammes, calories 746. On January 5th, 1926, that is, after having been for 12 days on a restricted diet, she was given 50 grammes of glucose on a fasting stomach, with the following result :—

JAN. 5.

Time	Blood Sugar per cent.	Urine Sugar per cent.	Urine Volume cc.
6-55 am. (fasting)	0.085	blue green	Residual urine
7-0 „ 50 grammes glucose		with Fehling's	
7-30 „	0.148	0.1	50
8-0 „	0.176	0.7	155
8-30 „	0.167	1.4	225
9-30 „	0.167	2.8	375
10-30 „	0.111	2.7	157
11-30 „		0.8	185

In the succeeding five days, the carbohydrate in the diet was still further increased, so that, on January 10th, she took total glucose 200, calories 1546, fatty acid : glucose ratio of 1.0. On this diet, the patient had thirst, polyuria (2760 cc.), and marked glycosuria (concentration 4.2 per cent., output 115 grammes *per diem*).

Another sugar tolerance was carried out on January 11th and the following data were obtained —

Time	Blood Sugar per cent.	Urine Sugar per cent.	Urine Volume cc.
10-0 „	0.180	4.7	170
6-55 am. (fasting)	0.155	2.9	Residual Urine
7-0 „ 50 grammes glucose			
8-0 „	0.205	2.8	115
9-0 „	0.243	4.7	170

On January 12th, the phenolsulphonephthalein test for renal functinn yielded the following figures for excretion of the dye :—

1st hour 6 per cent.
2nd „ 24 per cent.

Table showing changes in Glucose Tolerance and ketogenic : antiketogenic balance during pregnancy in a diabetic. patient (Mrs. B.)

Date	Urine			Per cent Blood sugar	Diet				Insulin units	Estimated Glucose Tolerance
	c.c. Volume	Acetone	(Gms.) Glucose		G	FA	$\frac{FA}{G}$	Calories		
24-12-25	1000	+	27·0		124	124	$\frac{1}{1}$	1510	—	97
7 - 1-26	2300	+	2.3		123	108	$\frac{1}{1\cdot3}$	1362	—	120.7
8 - 1-26	3126	+	21·0		142	126	$\frac{1}{1\cdot1}$	1512	—	121
13 - 1-26	2400	+	26·0		124	124	$\frac{1}{1}$	1510	—	98
19 - 1-26	1930	—	tr		124	124	$\frac{1}{1}$	1510	19	115
21 - 1-26	1860	—	tr		140	147	$\frac{1}{1}$	1748	24	116
24 - 1-26	1640	tr	tr		140	190	$\frac{1\cdot3}{1}$	2135	24	116
25 - 1-26	1200	+	tr	0·128	141	211	$\frac{1\cdot5}{1}$	2401	24	116
27 - 1-26	1975	+ +	tr		149	207	$\frac{1\cdot4}{1}$	2236	24	125
1 - 2-26	1940	tr	—	0:095	168	183	$\frac{1\cdot12}{1}$	2291	24	144
8 - 2-26	2351	tr	—		180	190	$\frac{1\cdot06}{1}$	2307	23	157
12 - 2-26	2550	tr	tr		180	190	$\frac{1\cdot06}{1}$	2307	16	164
24 - 2-26	2050	—	—		180	190	$\frac{1\cdot06}{1}$	2307	13	167
9 - 3-26	1882	—	—	0·130	189	189	$\frac{1}{1}$	2268	16	173
18 - 3-26	1650	—	—	0.135	193	178	$\frac{1}{1\cdot08}$	2225	19	174
4 - 4-26	?	+	—		193	178	$\frac{1}{1\cdot08}$	2225	19	174
8 - 4-26	?	—	—	0.160	192	162	$\frac{1}{1\cdot18}$	2072	19	173
10 - 4-26	?	—	—		195	178	$\frac{1}{1\cdot08}$	2225	22	171
14 - 4-26	?	tr	—		193	178	$\frac{1}{1\cdot08}$	2225	22	171

On the 17th February 1926, the patient was discharged from the nursing home and reported daily. She was re-admitted a week before the expected date of confinement.

During the later months of her pregnancy, she felt well and was able to take moderate exercise. Between the date of coming under insulin treatment, 16th January, 1926 and term, 16th April, 1926, she gained 10 pounds in weight. Slight loss of subcutaneous fat from about the shoulders was observed.

Owing to the readiness with which acetonuria was produced it was impossible to raise the calories by the usual means of raising the fat in the diet, while to have obtained any considerable increase in calories from carbohydrate would have necessitated giving much larger doses of insulin. It was thought advisable in any case, however, to avoid over-alimentation, so a diet of moderate heat value was decided upon.

Dr. Macrae Taylor attended the patient at her confinement and I am indebted to him for the obstetrical notes on the case from which the following is taken :—

"Quickening, 10th November, 1925. Probable date of labour, 15th April, 1926. Seen in consultation with Dr. R. W. Johnstone, with a view to deciding whether labour should be induced. The position was found to be left occipito anterior. Fœtal heart just audible to right side and below the umbilicus, due to the presence of a placenta lying to the left, so that the fœtal heart was only heard at the right border of the placenta. Sounds faint but regular. Rate 144 per minute. Movements of child good. *Per vaginam* promontory of sacrum cannot be reached by examining finger. Pelvis roomy."

There was no sign of hydramnios and, as the patient's general condition was good, it was decided to allow the pregnancy to go to term.

At no time during pregnancy was albumin found in the urine.

The patient stated that during mild hypoglycæmic attacks which occurred while the dose of insulin and the diet were being adjusted, the fœtal movements became imperceptible. Evidently no harm to the child resulted.

Labour : Labour began at 5 a.m. on 16th April 1926. Insulin was given at the usual times (6.30 a.m., noon, and 6.0 p.m.), and in the same doses as on the preceding day. The intake of carbohydrate was, however, much increased, the total glucose, exclusive of 90 grammes given in the form of dihydroxyacetone, being 227.3 grammes, while fatty acid only amounted to 56 grammes, giving a $\frac{\text{Fatty acid}}{\text{Glucose}}$ ratio of $\frac{1}{4}$ This was done in order to inhibit ketosis.

The patient took breakfast, consisting of oatcakes 48 grammes,

1 egg, bacon 30 grammes, cream 30 cc. butter 15 grammes, but during the remainder of the day she received only fluids:—milk, 200 cc. and orange juice, 1300 cc., to which was added glucose 60 grammes. In addition, from 12 noon to 4 p.m. the next day, dihydroxyacetone was given in solution, two hourly, in doses of 10 grammes. The feeds were given in small quantities at intervals of one to two hours.

Labour proceded under hyoscine and morphine narcosis, the first injection being given about 10 a.m. The pains were good during the early part of the day, but towards evening very slow progress was being made. "Midnight: head on perineum. Position: occipito-posterior. Administration of a few whiffs of chloroform. Head rotated by the forceps and male child, 8½ pounds weight delivered easily at 1.20 a.m. Uterus failed to contract on placenta in spite of Crede's and other methods employed. Injection of pituglandol (1.0 cc. extract of posterior lobe of pituitary gland=0.20 grammes of fresh *pars infundibularis*) at 2.10 a.m Finally, placenta had to be removed at 3 o'clock manually, after which 2.0 cc. of extract of ergot (P. D. and Co.), was administered intramuscularly. There was a good deal of hæmorrhage. One stitch put in perineum. Recovery uneventful."

On 17th April, 1926, the same dose of insulin was given, and the patient continued to take a high carbohydrate , low fat diet, but containing a little more solid food. Thus: milk, 240 cc.; potato,45 grammes; bread, 90 grammes; fish, 30 grammes; chicken, 30 grammes; butter, 20 grammes; orange juice, 1000 cc.; glucose, 60 grammes.

This represents glucose 194 grammes, fatty acid 40 grammes, $\frac{\text{Fatty acid}}{\text{Glucose}} \frac{1}{4.8}$.

In addition, dihydroxyacetone administration was continued in doses of 10 grammes every two hours, 110 grammes being given in all.

The blood sugar was examined at intervals during labour and on the following day and the following readings were obtained:—

Date	Time	Blood Sugar per cent.
April 16, 1926	5 a.m. Labour began	
	11-15 „	0.086
	6 p.m.	0.148
	10-15 „	0.160
April 17, 1926	1-20 a.m. Child delivered	
	6 0 a.m.	0.316
	12-0 moon	0.20
	6-30 p.m.	0.20

Each specimen of blood was also examined for acetone bodies, but none was found. The first specimens of urine obtained on 17th April, 1926 were also free from acetone.

Puerperium

Table showing changes in glucose tolerance and ketogenic: antiketogenic balance during puerperium in diabetic Mrs. B.

Date	Urine		Blood sugar Per cent	Diet				Insulin units	Estimated Glucose Tolerance
	Acetone	Glucose		G	FA	$\frac{FA}{G}$	Calories		
19 - 4-26	–	–	0.113	193	137	$\frac{1}{1.4}$	1938	22	171 + *
20 - 4-26	–	–	0.118	190	178	$\frac{1}{1.1}$	2209	18	172 + *
21 - 4-26	–	–		208	173	$\frac{1}{1.2}$	2231	5	197 – *
22 - 4-26	–	–	0.130	191	121	$\frac{1}{1.16}$	2110	—	186 + *
23 - 4-26	–	–		64	48	$\frac{1}{1.13}$	654	—	?
24 - 4-26	–	–		85	118	$\frac{1.35}{1}$	1308	—	?
27 - 4-26	tr	–		91	130	$\frac{1.46}{1}$	1500	—	?
29 - 4-26	–	tr		101	151	$\frac{1.5}{1}$	1701	—	101
4 - 5-26	–	–		113	169	$\frac{1.5}{1}$	1908	—	113
6 - 5-26	–	tr		119	177	$\frac{1.5}{1}$	2010	—	110
7 - 5-26	–	–		119	177	$\frac{1.5}{1}$	2010	—	119
8 - 5-26	–	–	0.143	119	133	$\frac{1.5}{1}$	2010	—	119

* Hypoglycaemic

Conclusions.

Glucose: insulin equivalent. Comparing 13th January, 1926 and 19th January, 1926, both on glucose 124, 19 units accounted for 26 grammes of sugar. Again, taking 8th January, 1926, and 25th January, 1926, both on glucose 140, 24 units accounted for 21 grammes of glucose The glucose : insulin equivalent is therefore approximately 1 gramme to 1 unit.

Glucose tolerance. This is estimated by subtracting from the glucose of the diet the amount of glucose in the 24 hours urine, plus one gramme of glucose for every unit of insulin given.

(*a.*). *Improvement in tolerance after starvation.*

December 24th, 1925 on admission; tolerance 97 on glucose 124, ratio $\frac{1}{1\cdot}$.

January 7th, 1926 after starvation; tolerance 120 on glucose 123, ratio $\frac{1}{1\cdot13}$

(b). *Fall in tolerance after few days of high carbohydrate diet*

January 13th, 1926, tolerance 98 on glucose 124, ratio $\frac{1}{1}$

(c). *Improvement in tolerance after insulin, progressing to end of pregnancy.*

January 7th, 1926, after starvation, tolerance 120 on glucose 123, ratio $\frac{1}{1.13}$ and no insulin.

March 9th, 1926, tolerance 173, on glucose 189, ratio $\frac{1}{1}$ and 16 units insulin.

The apparent tolerance in the latter case may be somewhat greater than the actual tolerance, owing to the rise in the renal threshold masking hyperglycæmia. The tolerance remained steady from the beginning of the ninth month till term.

(d). *During labour.* The utilization of carbohydrate, as judged by the blood sugar, was remarkedly good, considering the large carbohydrate intake. The blood sugar had only risen to 0.160 by 10.15 p.m. After delivery and on the following day there was a marked rise in the blood sugar to over 0.2 per cent. although less carbohydrate was given.

(e). *Improvement in tolerance between the third and sixth day of puerperium.*

April 8th, 1926, a week after parturition, tolerance 173 on ratio $\frac{1}{1.18}$

April 21st, 1926, five days *post partum,* tolerance over 195, as patient had hypoglycæmia.

(f.) Two weeks post partum, on returning to a high ratio diet and stopping insulin, the tolerance reverted to that which it had been, on a similar ratio, about a week after the beginning of insulin treatment, that is, about the middle of the seventh month. Thus, on the 25th of January, 1926, tolerance was 116 on ratio $\frac{1.5;}{1.0}$ on the 7th May, 1926, it was 119 on same ratio. This was also the approximate tolerance, on a $\frac{1}{1}$ ratio at the beginning of the seventh month 7th January, 1926, after a period of starvation and before giving insulin.

Renal glucose threshold. The renal threshold was low from the time of coming under observation, about the middle of the sixth month, until the beginning of the ninth month. Thus on

5th January, 1926 (see sugar tolerance test) there was sugar in the urine with a fasting blood sugar of 0.10 per cent. On 9th March, 1926 there was no glycosuria with a blood sugar of 0.130 per cent. and on 8th April, 1926 glycosuria was still absent though the blood sugar was 0.160 per cent.

During the puerperium the threshold remained high—over 0.143 per cent. (8th May, 1926).

Ketosis. The marked tendency to ketosis and its gradual accentuation as pregnancy advanced is shown by the low $\frac{\text{Fatty acid}}{\text{Glucose}}$ ratio necessary to abolish acetonuria. Thus on 19th January, 1926, with a low calorie diet (1500 calories) and a trace of sugar in the urine, a $\frac{1}{1}$ ratio was necessary to render the urine acetone-free. On 24th February, 1926, with a diet of higher caloric value, (2307 calories), a $\frac{1.16}{1.0}$ ratio was tolerated; but between 4th April, 1926 and 16th April, 1926, acetone appeared in quantity in the urine on a diet of 2225 calories and a $\frac{1.0}{1.08}$ ratio. It took a ratio of $\frac{1.0}{1.18}$ to abolish the acetonuria.

During labour and immediately afterwards, the high carbohydrate diet completely prevented ketosis.

After the birth of the child, a striking change took place. Thus, on the eighth day of the puerperium, a $\frac{1.35}{1.0}$ ratio with only 1308 calories was tolerated without acetonuria. The change is well brought out by comparing what occurred, on the optimum ratio, during the seventh month of the pregnancy and in the second and third weeks after delivery. Thus :—

Date	Fatty acid : Glucose ratio	Calories	Acetonuria
Jan. 25, 1926	$\frac{1.5}{1}$	2401	+
„ 27, 1926	$\frac{1.4}{1}$	2236	+ +
Apl. 29, 1926	$\frac{1.5}{1}$	1701	—
May 7, 1926	$\frac{1.5}{1}$	2010	—

The patient later reported that, occasionally, a trace of acetone appeared in the urine on the $\frac{1.5}{1.0}$ ratio, but a $\frac{1.3}{1.0}$ ratio kept the urine acetone free.

The diminished tendency to ketosis made it possible to stop the insulin and to give enough fat to supply the necessary calories.

It may be remarked that there was very little milk in the breasts and no steps had to be taken to stop the secretion. The patient

refused to attempt to suckle the child, because of the fear (ungrounded, of course) of transmitting diabetes to the child.

The infant appeared healthy in every way. His blood sugar was that of a normal infant (204), and his urine, examined a week after birth, contained no sugar.

A change in the texture of the skin of the mother was noted before and after birth. Thus, during pregnancy, owing to the toughness of the skin a special platinum iridium needle had to be procured for the insulin injections. *Post partum*, the skin was easily penetrated by an ordinary steel needle, without causing discomfort.

Seen six months after delivery the patient looked well, felt well and had gained weight. Her sugar tolerance had also improved and she was able to take more carbohydrate, while the urine remained sugar-free, as well as glucose-free. Nevertheless, after the injection of 50 grammes of glucose the blood sugar curve was abnormally heightened and prolonged, showing that there was still some impairment of pancreatic function.

Influence of Pregnancy upon Diabetes. There can be no doubt about the unfavourable effect of pregnancy upon diabetes. In those who are predisposed by heredity, or otherwise, pregnancy may be the starting point of the malady, while those who are already subjects of the disease suffer an exacerbation.

When diabetes appears for the first time during pregnancy, it usually manifests itself about the fifth or sixth month. It begins insidiously, as a rule, but, owing to the special tendency to ketosis, an attack of coma may be the first intimation of its existence. It is rare for the condition to be diagnosed before the fourth month, while the onset is exceptional after the eighth month. No doubt many of the cases so discovered have been mild or unrecognized diabetics before the pregnancy began. Bouchardat (*loc. cit.*) has noted the the onset of diabetes after delivery and during lactation, but, it is probable that he may have been dealing either with a mild, hitherto unrecognized, diabetes, or one masked by a high renal threshold during the last month of pregnancy, if not with a simple lactosuria. A family history of diabetes is often obtained.

The factors responsible for precipitating the final breakdown in sugar tolerance may be either those mentioned in connexion with early alimentary glycosuria, or the changes in the glands of internal secretion, whose *rôle* has been discussed in relation to late alimentary glycosuria. That the disease should commonly begin about the same time as the late alimentary glycosuria is suggestive; but, in some cases, it may be that the damage done in earlier months gives rise to a progressive loss of pancreatic

function which only manifests itself in symptoms or in marked glycosuria and acetonuria in the fifth or sixth month. The increased appetite and greater intake of food, after the period of morning sickness has passed, are also predisposing factors to be reckoned with.

Cases decribed as diabetes, beginning in the fifth month and disappearing rapidly within about ten days of delivery (205—210) —so-called "transient diabetes of pregnancy"—probably belong to a special class and may be regarded as severe instances of late alimentary glycosuria, whose nature and whose relation to pancreatic diabetes have already been dealt with.

It is generally recognized that the prognosis is better when diabetes begins during pregnancy than when pregnancy occurs in an individual already suffering from diabetes. This may be due, partly to the difficulty in distinguishing between marked cases of late alimentary glycosuria and pancreatic diabetes, and partly to the fact that a pancreas already damaged would be more vulnerable and liable to suffer further injury and loss of function than one effected for the first time. The necessity for giving a diet relatively high in carbohydrate, in order to ward off acidosis, makes it difficult if not impossible to rest the pancreas in the pregnant diabetic. This difficulty would to some extent be overcome by the use of insulin, which would make it possible to give the extra carbohydrate without causing hyperglycæmia. In the cases treated with insulin so far recorded, the prognosis with respect to the mother has been immensely improved, her life having been in each instance preserved; but the results have not been uniformly favourable as affecting the child nor as regards the further progress of the diabetes. This was, in some instances, evidently due to imperfect control of the diabetes, while one case (Graham's, *loc cit.*) was complicated by an influenzal infection. Labbé and Couvelaire's case (*loc. cit.*), however, the patient, in spite of some vicissitudes, suffered no less of tolerance as a result of pregnancy and a healthy child was born. It would be desirable to have further cases put on record, in order to form a proper estimate of the value of insulin in the treatment of the pregnant diabetic.

With careful dieting alone, a number of diabetics have survived pregnancy (211—213). Von Noorden brought as many as thirty-seven diabetics to term. Perhaps too much stress has been laid upon very severe cases, and most of our *data* refer to the period before modern blood chemistry and before the development of modern methods in the treatment of diabetes. It seems likely that, in the past, many deaths from coma have been due to cutting down the carbohydrate in the diet without simultaneous reduction in the

fat—a procedure dangerous enough in the ordinary diabetic but much so in the pregnant.

There is no uniformity in the reports of different observers regarding the changes in sugar tolerance at different periods of pregnancy and the puerperium. Some have noted a progressive deterioration of tolerance as pregnancy advanced which was continued during the puerperium and afterwards. On the other hand, Joslin (214) and Maase (215) have observed an improvement in tolerance towards the end of pregnancy, even in severe diabetics, while Williams (216) has noted that often in diabetic women the glycosuria disappears in the later months. After delivery, or after the death of the fœtus *in utero*, in contrast to what happens in the toxæmias of pregnancy , there may be an exacerbation of the condition (216—217); but many cases are on record in which a decided improvement in tolerance occurred after delivery. The clinical evidence is therefore conflicting, which is not surprising considering the many factors capable of modifying a glycosuria. Mrs. B. showed a gradual improvement in tolerance, such as might occur in an ordinary diabetic under insulin treatment; with the exception of the first 48 hours *post partum*, the tolerance for the first few days after delivery was apparently higher still, but, within a fortnight it reverted to that which it had been about the middle of pregnancy.

The question of the improvement in tolerance towards the end of pregnancy has attracted the interest of physiologists. Thus, Carlson and his co-workers (218—220) found that pancreatectomy in the pregnant bitch near term did not give rise to glycosuria so long as the fœtuses were alive and the placental connexions intact. After delivery of the pups, or on their death *in utero*, acute diabetes ending in death ensued. These findings have been confirmed by Pitimada (221), Lafon (222) and Falco(223). The absence of glycosuria before parturition was ascribed by Carlson to the passage of the internal secretion of the fœtal pancreas through the placenta to the mother. Allen (224), however, failed to obtain evidence in support of this view. Employing partially depancreatised dogs, with a pancreas graft beneath the skin, from which further portions could be removed without any severe operative interference, he was able to show that the removal of a small additional fragment from the graft in pregnant bitches near term could give rise to glycosuria; in other words, diabetes was not prevented by the presence of the fœtuses *in utero*. He attributes the absence of glycosuria in Carlson's experiments to cachexia resulting from operative procedure. Allen found that partially depancreatised bitches showed a further decrease in tolerance when they became pregnant, but that the tolerance seemed to be much

the same in early and in late pregnancy, while some improvement occurred after delivery. The changes in tolerance observed in the human subject are evidently the result of other variables.

Though Allen's experiments were carried out under much better conditions than Carlson's, they do not exclude the possibility that, in diabetes, the fœtal pancreas may compensate to some extent for the maternal deficiency. In none of the animal experiments was diabetes present; in fact, the existence of diabetes, in the bitch, appears to be incompatible with the continuation of pregnancy.

We have already seen that sugar passes rapidly from the maternal into the fœtal circulation, hyperglycæmia in the mother being accompanied by hyperglycæmia, though of lesser degree, in the fœtus. Associated with the augmented supply of sugar to the fœtus in diabetes, there occurs a remarkable hypertrophy and hyperplasia of the islet tissue of the fœtal pancreas (*vide seq.*), which may be increased to over twenty times the normal amount —no doubt a response to the increased functional demands made upon it. The question which has to be decided is whether the insulin secreted by the enlarged islets is entirely used by the fœtus, or whether some of it diffuses into the maternal circulation. The known physical properties of insulin do not seem to militate against the possibility of such diffusion, since it passes readily into practically all the tissues of the body. In Allen's experiments, though the animal had a limited tolerance owing to partial depancreatisation, actual diabetes (hyperglycæmia) was absent until the additional fragment of pancreas was removed near the end of pregnancy. There was nothing prior to the latter operation, therefore, to stimulate the gradual development of compensatory hypertrophy in the fœtal pancreas. Hence, the conditions are not comparable with those in human diabetes. Macleod (225), in support of Allen, those in human diabetes. Macleod (225), in support of Allen, found that in a pregnant depancreatised bitch treated with insulin, there was no change in the carbohydrate tolerance throughout pregnancy. But, here again, the diabetes was held in check, so that there would not necessarily be any call upon the fœtal pancreas for extra insulin. Moreover, any insulin provided by the fœtal pancreas would have an insignificant effect when added to the large doses which had been supplied artificially.

Apart from any diffusion of insulin from the child to the mother, the utilization of carbohydrate in the fœtus itself may be a factor in bringing about an apparent improvement in tolerance, or at least in maintaining the apparent tolerance at the previous level. Thus, according to the completeness with which the fœtus is able to deal with the extra sugar supplied to it, to that extent will it

relieve the maternal organism and any rise in the mother's blood sugar would be accompanied by an increased rate of diffusion of sugar across the placenta, owing to the difference in concentration between the fœtal and the maternal blood sugar.

Whether or not the severance of the placental connexion has the significance ascribed to it by Carlson, there is no doubt about the danger attending parturition in the pregnant diabetic. During labour, increased mobilization of the glycogen in the liver and muscles takes place, while, owing to the severe muscular exertion, sugar is rapidly burnt up in the muscles, with the result that the available supplies of carbohydrate in the body soon become exhausted. This may give rise to acetonuria even in the normal individual, but in the diabetic, whose glycogen reserves are small, it may precipitate an attack of coma.

Among additional factors acting in the same direction are the administration of anæthetics, especially chloroform, also hæmorrhage and pain.

These dangers are usually over in about forty eight hours after delivery; but then, in insulin treated cases, another danger may arise in the shape of hyperglycæmia. This was observed between the third and sixth day of the puerperium in the case of Mrs B. and on the second day in Ehrenfest's case. Macleod (*loc. cit.*) also noted it on the day following parturition in his insulin treated bitch.

Three possibilities suggest themselves by way of explanation of this phenomenon. The first is the spontaneous rapid return of tolerance which is the rule in the so-called "transient diabetes of pregnancy." This would readily give rise to relative overdosage in cases treated with insulin. This explanation would only hold in a limited number of cases. The next and most obvious suggestion is that it may be due to the excretion of carbohydrate in the form of lactose in the milk. This latter would be analogous to the milk fever in cows which, according toWidmark and Carleus (226) is a hypoglycæmic phenomenon and can be cured, either by injecting glucose, or by inflation of the udders, the latter both stopping secretion of the milk and reflexly giving rise to hyperglycæmia. It is doubtful whether lactation could have been sufficient to cause hypoglycæmia in the case of Mrs. B. as there was very little milk in the breasts at any time and she never suckled the child. Lastly, it seems possible that the replenishment of the carbohydrate reserves after their depletion during labour may have occasioned a temporary improvement in tolerance. This is suggested by the fact that by the second week *post partum* the tolerance had fallen to a lower level than it had been since the seventh month of pregnancy.

In the diabetic, the disturbance on the ketogenic; antiketogenic balance, normal to pregnancy, is accentuated owing to the diminished ability to oxidise carbohydrate. From what has been said regarding the cause of acetonuria in the later months of normal women, it is easy to understand why, in the case of Mrs. B., ketogenesis became more and more marked, in spite of the gradual improvement in sugar tolerance. After the birth of the child, however, the tendency to ketosis was much less, even when the sugar tolerance had fallen to a lower level than at the end of pregnancy.

It would be interesting to note whether as marked a change occurs in women whose milk secretion is abundant.

Influence of Diabetes upon Pregnancy.

The Mother. The maternal mortality of pregnant diabetics has been estimated at between 25 and 50 per cent. (Offergeld (227) —50 percent.; Vinay (228)—55 per cent.; Chapiet (229)—25 per cent.; Stengel (230)—26 per cent.; Ruoff (231) 46 per cent.; Williams (232) found the death rate in his series to be 27 per cent. during pregnancy and 23 per cent. during the two years following it.

Pregnancy is interrupted spontaneously between the sixth and eighth month in about a third of the cases (233).

Labour is apt to be not only premature but difficult owing to the large size of the fœtus, and there are special dangers attending manipulative interference or trauma, owing to the increased susceptibility to infection.

Puerperal infection is frequent and severe, and usually terminates in coma.

The Child. The fœtal mortality (including not only infants which die *in utero,* but those which succumb as a result of difficult labour) is estimated at about 50 per cent. (234). The future of those which survive is also bad, 80 per cent. dying in the first few days after birth (Cron). The development of acidosis may cause the death of the child *in utero.*

Hydramnios is of frequent occurrence (Ludwig 27 per cent.—(235); Chapiet 27 per cent.—(236) and is also a common cause of abortion or death of the fœtus. The earlier observers noted the sweet taste and sticky consistence of the amniotic fluid, indicating the presence of an excessive amount of sugar. Unfortunately, accurate methods were not then available for measuring the concentration of the sugar present, but according to the observations of Ludwig (237), Rossa (238), Herman (239), Hofmeier (240), and

Offergeld (241), it varied between 0.165 per cent. and 0.7 per cent. The normal percentage is about 0.054.

For those who are prepared to admit that, in the later stages of pregnancy, the amniotic fluid may be, in part at any rate, secreted by the fœtal kidneys, there would be no difficulty in understanding why hydramnios should occur. If we suppose that the fœtal kidneys have a threshold for sugar excretion, as in the case of the individual after birth, then normally the blood sugar would not exceed this threshold and only traces of sugar, undetectable by ordinary tests, would appear in the amniotic fluid, as in the case of normal urine. But, if the maternal hyperglycæmia caused the fœtal blood sugar to rise above the threshold, then the percentage in the urine would rise to or above that of the blood and diuresis would occur. If, as a result of the concentration of sugar by the fœtal kidneys, the osmotic pressure from which it is separated by the amniotic fluid rose above that of the blood in the vessels of the amniotic membrane, fluid would be attracted into the sac from the tisues, until osmotic equilibrium was established. The increased volume of fluid in the amniotic sac would, therefore, be of twofold origin—fœtal diuresis and osmosis from the surrounding tissues. The volume of amniotic fluid may be as much as 12 litres (242—243).

Labbé and Couvelaire (*loc. cit.*) have recently described a remarkable case in which hydramnios appeared in a pregnant diabetic under insulin treatment whenever the patient broke the rules and took too much food, but promptly disappeared on returning to a strict regimen.

Excessive size of the fœtus (Maygrier 6750 grammes; Anderodias 700 grammes; Dubreuil and Anderodias 5050 grammes Demelin and Fouquiaux 6100 grammes) apparently the result of excessive supply of sugar, may give rise to dystocia (244—245). Fournier describes them as "des petits colosses aux pieds d'argile, des inaptes â la vie."

The hypertrophy and hyperplasia of the islets of Langerhans in the fœtal pancreas, already referred to, was first noted by Dubreuil and Anderodias (246), who described the islets as "large compact epithelial masses occupying about a quarter of the field of the miscroscope and about twenty to thirty times the normal size." Recently, Gray and Freemster (247) have reported a similar case in which there was approximately 24 times as much insular tissue as in the normal pancreas. The child developed a pasty colour and died on the fourth day after birth. On the third day, the child's blood sugar had been 0.067 per cent. and these authors suggest that the cause of death may have been hypoglycæmia, the result of excessive production of insulin by the enlarged islets.

If the islets do, indeed, produce such an excess of insulin, it would have some bearing upon the question previously raised, as to whether all the insulin secreted by the fœtal pancreas is used by the fœtus itself or whether some of the excess passes to the mother. It may be mentioned, however, that the figure for blood sugar is comparable with those found in premature infants, apart from diabetes (248). As might be expected, from the facts just cited, diabetes is a very exceptional occurrence in the child born of a diabetic mother. Sugar may be found in the urine of the newly born child owing to the hyperglycæmia present before birth.

Diagnosis. When sugar appears in the urine during pregnancy, the patient should be placed on a diet containing 150 to 200 grammes of glucose and kept on it for two or three days. If the patient had previously been taking a diet poor in carbohydrate and the glycosuria diminishes or disappears on the above, carbohydrate starvation may have been the cause of the diminished tolerance.

If the percentage of sugar in the urine is not more than 0.2 to 0.3 per cent. (giving a bluish green opalescence with Fehling's test) and the output does not exceed 10 grammes *per diem,* diabetes need not be suspected. A glycosuria which is very little influenced by diet is also unlikely to be of diabetic origin. The diagnosis between diabetes and other forms of glycosuria may be materially aided by examination of the blood sugar. The fasting blood sugar, taken before breakfast, should first be determined. During pregnancy this should be normal by within the same limits as in the non-pregnant (249—254). If it be much above normal, diabetes should be diagnosed. If, however, it be normal, diabetes cannot be excluded, as a low renal threshold may cause the rapid excretion of the excess of sugar during the preceding fast, and a sugar tolerance test becomes necessary. Before carrying out the latter, the patient should be kept on the above carbohydrate-rich diet on the days preceding the test, otherwise equivocal results may be obtained, as in the case of Mrs. B. In the presence of diabetes, an abnormally heightened and prolonged blood sugar curve is obtained after the ingestion of 50 grammes of glucose. A normal curve, with sugar in the urine, indicates the presence of a pure renal glycosuria. A diabetic curve, with glycosuria occurring before the blood sugar rises above 0.17 per cent., means that a lowered renal threshold is present in addition to diabetes.

The early alimentary glycosuria of pregnancy should not be confused with diabetes, though the blood sugar curve may be higher and more prolonged than normally. It is exceptional,

however, for the blood sugar to rise above 0.2 per cent. and the glycosuria, on an ordinary diet, is usually slight.

No practical distinction need be drawn between mild diabetes and the so-called "transient diabetes of pregnancy," as the latter may be followed by a permanent diabetes, and anti-diabetic measures should be adopted both for prophylaxis and in order to prevent complications. Though, in these cases, the feeling of weakness is relatively less marked in proportion to the severity of the glycosuria, the presence of symptoms is not essential to the diagnosis of diabetes, a large proportion of diabetics, two-thirds, according to John (255), complaining of none when the condition is first discovered. In any case, the evaluation of symptoms is apt to be difficult in pregnancy. The general characters of the glycosuria such as variability etc., as previously set forth, and the history of similar phenomena in previous pregnancies may assist in forming a prognosis, but the rapid disappearance of the condition *post partum* finally clears up the matter. The intensity of the ketosis and the difficulty in controlling it in diabetes may confirm one's suspicions of that disease, but too much stress must not be laid upon this phenomenon. It may be recollected that the odour of acetone in the breath was the first thing to draw attention to the diabetic condition in the case of Mrs. B.

Treatment. The importance of rest and avoidance of chills or exposure to infection of any kind should be insisted upon.

The arrangement of the diet for the pregnant diabetic is along the same general lines as in the ordinary diabetic, but with the introduction of special modifications to meet the caloric and protein requirements and the disturbed ketogenic; antiketogenic balance. The dietic whims of pregnant women have also to be considered and satisfied as far as possible, provided that essentials are adhered to.

Caloric Requirements. Since the caloric requirements of the pregnant woman are only some 4 per cent. above the basal requirements of the non-pregnant, reckoned on the basis of body weight, and as there is no difference in this respect between the diabetic and the normal (256), only a small addition to the energy value of the diet is necessary. Thirty-five calories *per* kilo should be quite sufficient.

Protein Requirements. During the later months of pregnancy, the organism retains about 5 grammes of nitrogen *per diem* in order to supply its own needs and those of the fœtus. In order to provide for this extra nitrogen, about ½ gramme of protein *per*

kilo, is necessary. This means that the pregnant diabetic should be given about 1.2 (1 to 1.5) grammes of protein *per* kilo of body weight.

Ketogenic; antiketogenic balance. Owing to the disturbance of the ketogenic; antiketogenic balance, it is impossible to give the optimum $\frac{\text{Fatty acid}}{\text{Glucose}}$ ratio of $\frac{1.5}{1.0}$. A ratio of $\frac{1.0}{1.0}$ should be given after the fifth or sixth month and it may be necessary to diminish the ratio still further in the last two months. It is most important to avoid ketosis, for, once it develops, it is more difficult to control than in the ordinary diabetic and, if marked, is accompanied by much nausea and vomiting.

After delivery, higher ratios may be given tentatively, but the optimum may not be tolerated for some time. The influence of lactation upon the ketogenic : antiketogenic balance, awaits investigation.

Insulin. The large amount of carbohydrate which must be given to prevent ketosis would have a deleterious influence upon the patient's pancreas were it not that, by the aid of insulin, this extra carbohydrate can be completely utilized. Provided, therefore, that the diabetes is efficiently controlled, pregnancy should not aggravate the disease to the same extent as before insulin was available. By avoiding hyperglycæmia, the development of hydramnios and of an excessively large fœtus, with their associated obstetrical complications such as abortion, death of the fœtus, and difficult labour, are prevented.

The blood sugar should be examined from time to time, especially towards the end of pregnancy, in order to make sure that hyperglycæmia is not being obscured by a rising renal threshold.

Insulin, by causing more efficient storage and combustion of carbohydrate, diminishes the tendency to acidosis, with its attendant dangers to mother and child, during both pregnancy and labour. The risks of confinement are also lessened by the increased resistance to puerperal infection.

Insulin exerts no deleterious influence upon the fœtus. Keeping the blood sugar normal probably prevents the excessive development of islet tissue, already noted, which has been mentioned as a possible cause of death from hypoglycæmia after birth. In the case of Mrs. B., minor attacks of hypoglycæmia which occurred when the dose was being fixed and which were promptly treated, appeared not to harm the child, though the mother stated that the fœtal movements seemed lessened when an attack was impending.

The patient may look forward to having the dose of insulin diminished or abolished after the birth of the child, owing to the possibility of giving more fat and less carbohydrate, thereby providing the necessary calories while giving the minimum of glucose as in the case of ordinary diabetics.

Wiener (*loc. cit.*) noted that the local tissue reactions to insulin were more marked during pregnancy than *post partum*. Mrs. B. exhibited no local reactions beyond what may have been due to trauma, but, during pregnancy, the epidermis became so tough that a special platinum iridium needle had to be employed for the injections. From the first day after parturition, the skin became softer, so that it could be pierced by an ordinary steel needle.

The general technique of insulin treatment is the same as in ordinary diabetics.

The management of a case of diabetes with pregnancy calls for close co-operation between the obstetrician and the biochemist and the physician. The patient should be kept under strict and continuous supervision throughout pregnancy, and the urine should be tested daily for sugar, acetone and albumin.

Diabetics should be advised not to become pregnant, but, once pregnancy has occurred, the question arises whether it should be allowed to continue. Since those who develop diabetes for the first time during pregnancy have a relatively good prognosis it is unnecessary to interfere in their case. When pregnancy complicates a pre-existing diabetes, there is the possibility of further loss of tolerance; but if the parents are anxious for a child and the woman is willing to submit to continuous treatment, under suitable conditions, during pregnancy, and to be prepared, if necessary, to take larger doses of insulin, then the pregnancy may be permitted to go on. Otherwise, abortion should be induced, due consideration being given to the special risk attendant upon any operative procedure in the diabetic (sepsis, danger from anæsthetic), while methods least likely to expose the patient to these dangers should be adopted.

Very ill-nourished and emaciated subjects are unfitted to stand the strain of pregnancy.

In cases of severe acidosis, accompanied by uncontrollable vomiting, in which it is probable that liver damage has occurred, evacuation of the contents of the uterus is necessary, in addition to other methods of combating toxæmia, in order to save the life of the mother. The fœtus will probably have died *in utero* in such a case.

When rapid loss of tolerance continues, in spite of treatment, termination of pregnancy is advisable.

In patients who have gone on to the later months without having their hyperglycæmia properly controlled, premature labour should be induced, as an excessively large child is to be expected. Cæsarean section, under nitrous oxide and oxygen, has been performed in some cases with good results (257).

Labour is best conducted under morphine and hyoscine narcosis, as the use of all but very small quantities of anæsthetics of the methane series, especially chloroform, is undesirable owing to their toxic action upon the liver and the ease with which they cause ketosis.

A dose of 1 cc. of pituitrin did not seem to do any harm in the case of Mrs. B., in spite of its physiological antagonism to insulin.

The usual doses of insulin should be administered during labour and the following 24 hours, and it is therefore necessary that at least the usual amount of glucose be consumed to balance it. It is safer to give a good deal of carbohydrate in excess of this amount in order to avoid ketosis. Mrs. B. had, perhaps, rather more than was necessary. The carbohydrate should be given in fluid and easily assimilable form—milk, orange-juice, glucose, dihydroxyacetone. On the first day of the puerperium, more solid food may be allowed—bread, potato, fish, chicken and some butter—in addition to milk and orange-juice or glucose. On the following days the carbohydrate should be reduced, while hyperglæcamia is to be watched for. Ultimately, a high fat and low carbohydrate diet may be tolerated and the insulin reduced or omitted.

Lactation is perhaps better avoided, as it puts extra strain upon the mother and necessitates the taking of more food.

BIBLIOGRAPHICAL REFERENCES.

1. Blot. *Compt. rend. de l' Acad. d. Sci.*, 1856, xliii, 676.
2. Kirsten. *Monatsschr. f. Geburtsh. u. Frauenkrank.*, 1857, ix, 437.
3. Williams. *Amer. Journ. Med. Sci.*, 1909, cxxxvii, 15.
4. Crook. *Proc. Roy. Soc. Med.*, (Sect. Obstet. and Gynæcol.), 1924, xviii, 33.
5. Lanz. *Wissensch. med. Presse*, 1895, xxxvi, 1857.
6. Payer. *Monatsschr. f. Geburtsh u. Gynäkol.*, 1899, x, 784.
7. Reichenstein. *Weiner Klin. Wochenschr.* 1909, xxii, 1445.
8. Reichenstein. *ibid.*, 1911, xxiv, 862.
9. Bergsma. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1912, lxxii, 105.
10. Höst. *Lancet*, 1925, i, 1022.
11. Rosenberg. *Klin. Wochenschr.*, 1924, No. 35, 1561.
12. Dietrich. *Klin. Wochenschr.*, 1922, No. 2, 1403.
13. Bauer. *Zentralb. f. Gynäkol.*, 1922, xlvi, 1413.
14. Zondek. *Zentralb. f. Gynäkol.*, 1922, xlvi, 851.
15. Frank. *Klin. Wochenschr.*, 1922, No. 2, 2084.
16. Novak. Porges u Stristower., *Zeitschr. f. Klin. Med.*, 1913, lxxviii, 413.

17. Hofbauer. *Zentralb. f. Gynäkol.*, 1922, xlvi, 348.
18. Graefenburg. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1909, lxv, 1.
19. Graefenburg, *Münich. Med. Wochenschr.*, 1909, lvi, 702.
20. Küstner. *Zentralb. f. Gynäkol.*, 1922, xlvi, 1238.
21. Küstner. *Monatsschr. f. Geburtsh. u. Gynäkol.*, 1923, lxii, 119.
21. Dickens, Dodds and Wright. *Biochem. Journ.*, 1925, xix, 858.
22. Allen and Doisy. *Journ. Amer. Med. Assoc.*, 1923, lxxxi, 819.
23 Doisy, Rallo, Allen and Johnstone. *Journ. Biol. Chem.*, 1924, lix, 43..
24. Dickens, Dodds and Wright. loc. cit. (21).
25. Dickens, Dodds and Wright. loc. cit. (21).
26. Frank u. Nothmann. *Münich. Med. Wochenschr.*, 1920, lxvii, 1433.
27. Nothmann. *Klin. Wochenschr.*, 1923, No. 1, 880.
28. Leçons de la pathologie obstétdicle., 1907, ii, 769, Paris, Asselin, et Houzeau, éditeurs.
29. Cron. *Amer. Journ. Obstet. & Gynæcol.*, 1921, i, 276.
30. Bauer. (loc. cit.) (13).
31. Nürnberger. *Deutsch. Med. Wochenschr.*, 1921 xlvii, 1124.
33. Roubitschek. *Klin. Wochenschr.*, 1922, No. 1, 220.
34. Brinitzer. Inaug. Dissert., 1922, Breslau.
35. Jaeger. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1913, lxxiv, 586.
36. Kamnitzer u. Joseph. *Die Therapie der Gegenwart.*, 1921, lxxiv, 586.
37. { Küstner. *Klin. Wochenschr.*, 1922, No 1, 1747.
Küstner. *Deutsch. Med. Wochenschr.*, 1922, xlviii, 543.
38. Long and Hirst. *New York Med. Journ.*, 1923, cxviii, 543.
39. Hollingsworth. *Cal. State. Journ. Med.*, 1922, xx, 344.
40. Hellmuth. *Klin. Wochenschr.*, 1922, No. 1, 1152.
41. Labbé. *Ann. de Med.*, 1922, xi, 273.
42. Maase. *Charité Ann.*, 1911, xxxv, 33.
43. Mann. *Zeitschr. f. Klin. Med.*, 1913, lxxviii, 488.
44. Lemann. *New Orleans Med. & Surg. Journ.*, 1922, lxxiv, 492.
45. Schneidermann. *Amer. Journ. Obstet. & Gynæcol.*, 1924, vii, 177.
46. Salomon, *Münich Med. Wochenschr.*, 1921, lxviii, 386.
47. Vignes & Barbaro. *Presse Méd.*, 1924, xxxii, 1918.
48. Faber & Norgaard. *Acat. Med. Scand.*, 1921, liv, 289.
49. Baudoin. Les glycémies, Rapport au xv iéme Congrès Français de Medicine Strasbourg., 1921, 203.
50. Hofmeister. *Zeitschr. f. Physiol. Chem.*, 1877, i.
51. Kaltenbach. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1879, iv, 161.
52. Lemaire. *Zeitschr. f. Physiol. Chem.*, 1895, xxi, 442.
53. Hempel. *Archiv. f. Gynäkol.*, 1875, viii, 312.
54. Brocard. La Glycosurie de la grossesse. Thése de Paris. 1898.
55. Voit. *Deutsch. Arch. f. Klin. Med.*, 1897, lvvii, 523.
56. Williams. (loc. cit. 1909.) (3).
57. Ney. *Arch. f. Gynäkol.*, 1889, xxxv, 239.
58. Von Noorden. Metabolism & Practical Medicine, 1907, iii, 737.
59. de Sinéty. *Compt. rend. soc. biol.*, 6 ième serie, 1877, iii, 343.
60. de Sinéty. ibid. 7 ième serie, 1883, iv, 229.
61. Wiener . *Amer. Journ. Obstet. & Gynæcol.*, 1924, vii, 710.
62. Foster. Diabetes Mellitus. Lippincott,, 1915, 99.
63. Rosenberg. loc. cit. (11) 1924.
64. Lublin. *Arch. f. Klin. Med.*, 1924, cxliii, 342.

65. Anderodias et Dubreuil. *Gaz. hebd. des sci. med. de Bordeaux*, 1921, Jan.
66. Lange. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1899, xl, 34.
67. Conte. Contribution à l'étude de l'hypophyse, Lausanne., 1898. Conte. *Beitr. zur path. Anat.*, 1898, xxiii, 90.
68. Gottschau. *Sitz. Ber. d. phys. med. Gesell zu Würzburg*. 1882, xvii & xviii.
69. Erdheim u Stumme. *Zeigler's Beitr.*, 1909, xliii, 1.
70. Kolde. *Arch. f. Gynäkol.*, 1912, xcviii, 505.
71. Kraus. *Beitr. z. path. Anat. u. z. allg. Path. Jena.*, 1914, lviii, 189.
72. Dott & Bailey. *Brit. Journ. of Surg.*, 1925, xiii, 314.
73. Cushing. "The Pituitary Body and its Disorders." New York, 1912.
74. Marek. *Zentralb. f. Gynäkol.*, 1914, xxxviii, 265.
75. Brown. *Lancet.*, 1924, pt. 1, 59.
76. Löhlein. *Monatsschr. f. Geburtsh. u. Gynäkol.*, 1924, lxv, 129.
77. Simmonds. *Verhandl. d. deutsch. path. Gesellsch.*, 1914, xvii, 208.
78. Tölken. *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1912, xxiv, 633.
79. Erdheim u. Stumme. loc. cit. (69).
81. Rosenburg. loc. cit. (11) 1924.
80. Borchardt. *Zeitschr. f. Klin. Med.*, 1908, lxvi, 332.
82. Foster. loc. cit. (62).
83. Wallis. *Journ. Obstet. & Gynæcol. Brit. Emp.*, 1922, xxix, 274.
84. Dixon and Marshall. *Journ. Physiol.*, 1924, lix, 276.
85. Burn. *Journ. Physiol.*, 1922—1923, lvii, 318.
86. Lambie. *Brit. Journ. Exper. Path.*, 1926, vii, 22.
87. Falco. *Ann. di Ostet. e Ginecol.*, 1916, xxxviii, 1.
88. Sertori. 1907, quoted by Labbé & Couvelaire.
89. Aron. *Compt. rend. soc biol.*, 1920, lxxxiii, 1122, 1448.
90. Cuilla. *Ginecol. Moderna.*, 1911, iv, 237.
91. Allen. *Amer. Journ. Physiol.*, 1920—1921, liv, 451.
92. Höst. loc. cit. (10).
93. Stolz. *Arch. f. Gynäkol.*, 1902, lxv, 531.
94. Bar. loc. cit. (28).
95. Forges u. Novack. *Ber. Klin. Woch.*, 1911, xlviii, Pt. 2, 757.
96. Harding. *Lancet*, 1921, ii, 327.
97. Lochead and Cramer. *Proc. Roy. Soc.* Lond., Ser. B., 1908, 80.
98. Carpenter & Merlin. *Arch. Int. Med.*, 1911, vii, 184.
99. Losee & Van Slyke. *Amer. Journ. Med. . Sci.*, 1917, cliii, 94.
100. Hofbauer. *Arch. f. Gynäkol.*, 1911, xvciii, 405.
101. Hofbauer. loc. cit.—1922, (17).
102. Burlando. *Arch. Ital. di Ginecol.*, 1906.
103. Maurel. *Compt. rend. soc. biol.* 1907, lxi.
104. Gottschalk. *Zeitschr. f. exper. Med.*, 1922, xxvi, 34.
105. Crainicianu & Popper. *Presse Méd.*, 1921, xxix, 424.
106. Didier et Philippe. *Presse Méd.*, 1921, xxix, 473.
107. Williams. *Amer. Journ. Obstet. Gynæcol*, 1922, iv, 26.
108. Rosenfield & Schneiders. *Journ. Amer. Med. Assoc.*, 1923, lxxx, 743.
109. Aron. loc. cit. 1920, (89).
110. Gierke. Habilitations-schrift, Freiburg., 1905.
111 Lockhead & Cramer. *loc. cit.* (97).
112. Bohr. Skand. *Arch. f. Physiol.*, 1900, x, 413.
113. Cohnstein u. Zuntz. *Arch. f. die Gesammt. Physiol.*, 1884, xxxiv, 173.

114. Hasselbalch. Bibliotek for Lager, Copenhagen., 1904.
115. Bailey & Murlin. *Amer. Journ. Obstet.*, 1915, lxxxi, 526.
116. Morriss. *Johns Hopkins Bull.*, 1917, n.s. xxxviii, 140.
117. Russell & Woglom. *Brit. Journ. Exper. Path.*, 1920, i, 244.
118. Pflüger. *Arch. f. d. Gesammt. Physiol.*, 1868, i, 61.
119. Farkas. *Arch. f. d. Gesammt. Physiol.*, 1903, xcviii, 490
120. Bohr & Hasselbalch. *Skand. Arch. f. Physiol.*, 1900, x, 149, 353.
121. Bohr & Hasselbalch. *ibid.*, 1903, xiv, 398.
122. Tangl. *Arch. f. d. Gesammt. Physiol.*, 1903, xciii, 327.
123. Tangl. *ibid.*, 1903, xciii, 362.
124. Tangl. *ibid.*, 1909, cxxx, 1. z
125. Tangl u. Mituch. *Arch. f. d. Gesammt. Physiol.* ,1908, cxxxi, 437.
126. Zuntz. *Arch. f. Gynäkol.*, 1910, xc, 452 .
127. Wittich, Myers & Jennings. *Journ. Amer. Assoc.*, 1920, lxxv, 1249.
128. Carpenter & Murlin. loc. cit. (98).
129. Losee & Van Slyke. loc. cit. (99).
130. Williamson. *Amer. Journ. Obstet. & Gynæcol.*, 1923, vi, 263.
131. Cook & Osman. *Guy's Hosp. Rep.*, 1923, lxxiii, 233.
132. Marrack & Boone. *Brit. Journ. Exper. Path.*, 1923, iv, 261.
133. Hasselbalch u Gammeltoft. *Biochem. Zeitschr.* 1915, lxviii, 206.
134. Murlin. *Amer. Journ. Physiol.*, 1910, xxvi. 134,
135. Benedict & Talbot. "Metabolism and growth from birth to puberty. Carnegie Inst. Pub., No. 302. Washington, 1921.
136. Bar & Daunay. *Journ. de Physiol. et de Path.*, 1905, vii, 832.
137. Murlin. *Amer. Journ. Physiol.*, 1910, xxvii, 177.
138. Murlin. *ibid.* 1911, xxviii, 422.
138. Bar. 1907, loc. cit. (28).
139. Zacharjewsky. *Zeitschr. f. Biol.*, 1894, xxx, 368.
140. Schrader. *Arch. f. Gynäkol.*, 1900, lx, 534.
141. Slemons. *Johns Hopkins Bull.*, 1904, xv, 67.
142. Hahl. *Arch. f. Gynäkol.*, 1905, lxxv, 185.
143. Rubner. *Arch. f. Hyg.*, 1908, lxvi, 185.
144. Herrmann u Neumann. *Biochem. Zeitschr.*, 1912, xliii, 47.
145. Coope & Mottram. *Journ. Physiol.*, 1914, xlix, 23.
146. Leathes & Raper. "The Fats. Monographs on Biochemistry., 1925, 156.
147. Coope & Chamberlain. *Journ. Physiol.*, 1924, lx, 69.
148. Hofbauer. Grundzüge einer Biologie der menschlichen Plazenta. W. Braumüller., 1905.
149. Slemons. *Amer. Journ. Obstet.*, 1919, lxxx, 194.
150. Daniels & Mendel. *Journ. Biol. Chem.*, 1912—13, xiii, 71.
151. Jägeroos. *Arch. f. Gynäkol.*, 1911, xciv, 656.
152. Couvelaire. *Ann de Gynécol., et de l'obstet.*, 1899, li, 417.
153. Blot. loc. cit (1).
154. Hofmeister. loc. cit. (50).
155. Duncan. *Trans. Journ. Lond. Obstet. & Gynæcol.*, 1922, iii, 20.
156. Bell. *Amer. Journ. Obstet. & Gynæcol.*, 1922, iii, 20.
157. Bingel. *Deutsch. Med. Wochenschr.*, 1912, xxxviii, 1684.
158. Folliet. *Gazette des Hopitaux.*, 1912, lxxxv, 1463.
159. Fruhinscholz. *Ann. de Gynécol.*, 1913, lxx, 477.
160. Hirschfeld. *Ber. Klin. Wochenschr.*, 1910, xlvii, 1053.
161. Lecorché. Du diabète sucré chez la femme. Paris, Delahaye et Lecrosnier, 1886.

162. Lemann. loc. cit. (44).
163. Rudau . *Revue des maladies de la nutrition.*, 1906, 261.
164. Planchu et Japiot. *Lyon Medical.*, 1910, civ, Pt. 1, 1035.
165. Bouchardat. *Diabète sucré. Paris*, 1883.
166. Offergeld. Wechselbeziehungen zwichen Diabetes und generalien Prozessen. Wurtzburg., 1909.
167. Williams. loc. cit., 1909, (3).
168. Joslin. *Boston Med. & Surg. Journ.*, 1915, clxxiii, 841.
169. Eshner. *Amer. Journ. Med. Sci.*, 1907, i, 375.
170. Neuman. *Zeitschr. f. ärtze Fortbild.*, 1913, x, 367.
171. Strouse. *Med. Clin. Chicago.*, 1917, ii, 47.
172. Lesse. *Monatsschr. f. Geburtsh. u. Gynäkol.*, 1902, xv, 680.
173. Lublin. loc. cit. (64).
174. Graefe. *Zentralb. f. innere Med.*, 1898, xix, 711.
175. Liepmann. *Arch. f. Gynäkol.*, 1903, lxx, 426.
176. Loeb. *Ber. Klin. Wochenschr.*, 1881, xviii, 601.
177. Hofmeier. *Ber. Klin. Wochenschr.*, 1883, xx, 641.
178. Nebel. *Zentralb. f. Gynäkol.*, 1888, xii, 499.
179. Seegen. Der Diabetes Mellitus. Berlin. A. Hirschwald., 1893.
180. Lecorché. *Ann. de Gynécol. et d'obstet.*, 1885, xxiv, 257.
181. Eisenhart. "Die Wechselbeziehungen zwichen internen und gynäkologischen Erkrankungen," Stuttgart, F. Erike., 1895.
182. Israel. *Virchow's Arch.*, 1881, lxxxiii, 181.
183. Frietsch. Inaugural dissertation, Leipsig., 1883.
184. Cohn. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1888, xiv, 194.
185. Strognowsky. Referred to in Frommels *Jahrbücher.* 1891.
186. Chiari. *Prager. Med. Wochenschr.*, 1893, xviii, 1.
187. Thorn. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1889, xvi, 57.
188. Von Noorden. "Die Zuckerkrankheit und ihre Behandlung," Berlin. Springer., 1917.
189. Lasègue. *Arch. gén. de Med.*, 1875, 6 ième serie, xxvi, Pt. 2, 581.
190. Reinhardt. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1919, lxxxi, 81.
191. Parisot. *Soc. méd. des hôpit. de Paris.*, 1911, xxxii, 95.
192. Hennenberg et Bickel. *Gynécol. et obstet.*, 1925, xii, 72.
193. Weiner. loc. cit. (61).
194. Joslin, Root and White. *Journ. Amer. Med. Assoc.* 1925, lxxxv, 420.
195. Allen and Sherrile. *Journ. Metabol. Res.*, 1922, ii, 803.
196. Fitz and Murphy. *Boston Med. & Surg. Journ.*, 1925, cxciii, 1092.
197. Macleod. Carbohydrate Metabolism and Insulin. Monographs on Physiology, 1926, 83.
198. Raveno. *Journ. Amer. Med. Assoc.*, 1923, lxxxi, 2101.
199. Ehrenfest. *Amer. Journ. Obstet. & Gynæcol.*, 1924, viii, 6.
200. Graham. *Proc. Roy. Soc. Med.*, 1924, xvii, (Sect. Obstet. & Gynæcol.), 102.
201. Wiener. loc. cit. (61).
202. Hennenburg et Bickel. loc. cit. (192).
203. Labbé et Couvelaire. *Bull. de l'acad de med.*, 1925, xciv, 1016.
204. Tisdall, Drake and Brown. *Journ. Lab. and Klin. Med.*, 1925, x, 704.
205. Anderodias and Dubreuil. loc cit. (65).
206. Perez. Boll. de la Soc. de Obstet. e Ginecol. Buenos Aires, 1924, July.
207. Shenk. *Amer. Journ. Obstet. & Gynæcol.*, 1924, viii, 457.
208. Williams. loc. cit. 1909, (3).

209. Wiener. loc. cit. (61).
210. Hennenberg et Bickel. loc. cit. (192).
211. Joslin. loc. cit. (168).
212. Neuman. loc. cit. (170).
213. Eshner. loc. cit. (169).
214. Joslin. "Treatment of Diabetes, 1924, 652.
215. Maase. loc. cit. (42).
216. Reinhardt. loc. cit. (190).
217. Wiener. loc. cit. (61).
218. Carlson and Drennan. *Amer. Journ. Physiol.*, 1911, xxviii, 391.
219. Carlson, Orr and Jones. *Journ. Biol. Chem.*, 1914, xvii, 19.
220. Carlson and Ginsburg. *Amer. Journ. Physiol.*, 1915, xxxvi, 217.
221. Fitimada. *Folia Medica.*, 1923, 9.
222. Lafon. *Compt. rend. soc. biol.*, 1913, lxxv, 266.
223. Falco. loc. cit. (87).
224. Allen. 1920—1921, loc. cit. (91).
225. Macleod. loc. cit. (197), 1926, 86.
226. Widmark u. Carleus. *Biochem. Zeitschr.*, 1924, clvi, 454.
227. Offergeld. *Arch. f. Gynäkol.*, 1908, lxxxvi, 160.
228. Vinay. Traité des maladies de la grossesse et des suites de couches. Paris, Baillière. 1894, 793.
229. Chapiet. Contribution à l'étude des rapports du diabète sucré et de la puerperalité. Thèse de Paris., 1907.
230. Stengel. *Univ. Penna. Med. Bull.*, 1904, xvi, 296.
231. Ruoff. *Amer. Med.*, 1903, v, 663.
232. Williams. loc. cit. 1909, (3).
233. Vignes et Barbaro. loc. cit. (47).
234. Chapiet. loc. cit. (229).
235. Ludwig. *Zentralb. f. Gynäkol.*, 1895, xix, 281.
236. Chapiet. loc. cit. (229).
237. Ludwig. loc. cit. (235), and *Wein. Klin. Wochenschr.*, 1899, xii, 305.
238. Rossa. *Zentralb. f. Gynäkol.*, 1896, xx, 657.
239. Herman. *Edin. Med. Journ.*, 1902, ii, 119.
240. Hofmeier. *Duet. Med. Wochenschr.*, 1906, xxxii, 672.
241. Offergeld. *Zeitschr. f. Geburtsh. u. Gynäkol.*, 1906, lviii, 189.
242. Lop. *Gazette des hôpitaux.*, 1899, lxxii, 502.
243. Liepmann. loc. cit. (175).
244. Demelin et Fouquiaux. *Bull. de la soc. d'Obstet. de Paris*, 1910, xiii, 159.
245. Chambrelent. *Bull. de la Soc. d'Obstet. de Paris.*, 1901, iv, 391.
246. Dubreuil et Anderodias. *Compt. rend. Soc. Biol.*, 1920, lxxxiii, 1480.
247. Gray and Freemster. *Arch. of Path. and Lab. Med.*, 1926, i, 248.
248. Schmal. *Zeitschr. f. Kinderheilkunde.*, 1924, xxxviii, 597.
249. Slemons. loc. cit. 1919. (149).
250. Kilian and Sherwin. *Amer. Journ. Obstet.*, 1921, ii, 15.
251. Rowley. *Amer. Journ. Obstet.*, 1923, v, 23.
252. Cron. loc. cit. (29).
253. Walthard. *Zentralb. f. Gynäkol.*, 1922, xlvi, 1301.
254. Couinaud et Clogne. *Gynécol. et Obstet.*, 1923, vii, 372.
255. John. *Texas State Journ. Med.*, 1923, Feb.
256. Joslin. *loc. cit.* 1924, (214)

A Contribution to the Pathology and Causation of Dysmenorrhoea.*

By

BECKWITH WHITEHOUSE, M.S. (London), F.R.C.S.

Professor of Obstetrics and Gynæcology.

(*From the Department of Obstetrics and Gynæcology, University of Birmingham*).

INTRODUCTION.

THE literature in connection with dysmenorrhœa if voluminous is on the whole disappointing, in that although numerous theories have from time to time been advanced, no very definite conclusions have hitherto been reached which can be said to establish the fundamental facts underlying the cause. Within recent years whilst much statistical material has been collected, new classifications suggested, and fresh terms introduced, no great progress has been made either with regard to our knowledge of the pathology or of the treatment of severe menstrual pain. A study of the available literature and especially of the report of the discussion upon dysmenorrhœa at the British Congress of Obstetrics and Gynæcology held in Edinburgh in 1923 shows that current opinion is apparently divided between the importance of various anatomical defects in the sexual apparatus, and what may be termed the emotional or hyperæsthetic index of the individual. The purpose of this paper, based upon a clinical and pathological study of 50 consecutive cases of severe dysmenorrhœa is to record certain new observations and, in the light of these facts, to suggest that our present conceptions of the causes of menstrual pain are in need of some revision.

The investigation carried out in my Department in Birmingham during the last two years has been conducted along the following lines:—

1. The observation of clinical and pathological details in the individual over a series of several consecutive "periods."
2. Examination of the menstrual lochia both in cases associated with and without menstrual pain.

* Read at the Centenary of the Coombe Lying-in Hospital Congress, Dublin, September, 17th, 1926.

3. Correlation of the clinical symptoms with the physical signs in the pelvis, especially with regard to the severity of the menstrual pain.

The work has been rendered possible by setting aside a few beds in the Gynæcological Department of the General Hospital. Birmingham for the systematic study of the subject, and by the co-operation of colleagues in allowing access to certain of their patients in order to study the phenomena of the menstrual function in cases uncomplicated by pelvic disease.

It is unnecessary in the present communication to detail at any length the opinions which we hold with regard to the menstrual function. In view, however, of certain remarks and arguments contained in this paper the salient points must briefly be noted.

We regard the sexual cycle in the human female as being divided into two phases—a "positive" and a "negative." The positive phase is initiated by ovulation on a date corresponding, approximately, to the 13th day of the so-called menstrual "cycle." It covers the period of development of the corpus luteum and the menstrual decidua, and continues until about the 26th or 27th day of the cycle. The negative phase is initiated by death of the unfertilized ovum with its corona radiata. It is characterized by degeneration of the corpus luteum followed by necrosis and expulsion of the menstrual decidua. It also includes the period of regeneration of the endometrium required after the menstrual abortion, and continues until the succeeding ovulation. With this conception, the arbitrary division of the endometrium into four stages as described by Adler and Hitschmann appears to be unnecessary and merely an elaborate description of the anatomical appearances consequent upon development and necrosis of the menstrual decidua. The so-called "pre-menstrual" stage is nothing more than a description of the endometrium when distension of the uterine glands has resulted from constriction of the ducts by the cells of the "stratum compactum." The menstrual decidua itself is to be regarded *as an intermediate stage* between the resting endometrium and the fully developed decidua of pregnancy at about the 12th week of gestation. Development of the decidua is dependent upon a hormone of the corpus luteum, and its necrosis ensues whenever this hormone is witheld by degeneration or removal of the lutein gland. Degeneration of the corpus luteum is probably normally initiated by absorption of the products of the dead unfertilized ovum, especially of the cells of the corona radiata, which morpho logically are identical with the cells of the tunica granulosa. In other words we regard the menstrual function as an abortion of the developing decidua and resulting from degeneration of the corpus

luteum. The latter is initiated by the vaccine action of the dead ovum, and especially by the cells of the corona radiata.

The Menstrual Lochia.

The products of the menstrual abortion are removed from the uterus in the form of the menstrual lochia. The discharge normally consists of the autolysed products of the decidua with a considerable amount of liberated uterine secretion from the previously distended glands of the "stratum spongiosum." There are also present a high proportion of polymorpho-nuclear cells and frequently small clots in process of solution. When the material is examined microscopically, "ghosts" of uterine glands and fragments of endometrial stroma can often be seen, as shown in Fig. I. It is important to note that in the normal process, although the products of tissue necrosis can be detected by the microscope, no solid particles, apart from occasional small clots, are discernible to the naked eye. The relation which the secretion of the uterine glands appears to have to this autolysis has been pointed out by us elsewhere, and it is unnecessary here to enter into further discussion.

With this brief resumé of the physiology of normal menstruation, the results of an investigation of the abnormal conditions present when the function is associated with menstrual pain, may next be considered.

Type of Case Investigated.

It should be stated that the investigation is concerned only, with comparatively severe degrees of so-called dysmenorrhœa—the type of case which, for many years, has been included under the heading of "spasmodic dysmenorrhœa" and more recently included under the term "intrinsic dysmenorrhœa" (Blair Bell). It does not take into consideration those cases of pre-menstrual discomfort, in some instances apparently amounting to pain, which are merely an exaggeration of the so-called "menstrual molimina." The symptoms associated with the latter are in a sense characteristic of the onset of the negative phase, and are in type and kind analagous to the clinical picture which often follows the administration of a bacterial vaccine, and probably have a similar etiology. *Exaggeration of the clinical symptoms of the negative phase is not to be confused with true dysmenorrhœa.* Neither is this paper concerned with menstrual pain complicated by "extrinsic" lesions or by any gross disease of the pelvic organs, *e. g.*, pelvic inflammation, or fibroids. *Pain of this type is not "dysmenorrhœa.* The word is a misnomer, and in our opinion the term "menorrhalgia," introduced by Massey, is preferable to express painful menstruation

which is a mere incidental clinical concomitant of a variety of lesions.

Dysmenorrhœa of the true and we think the only type, is a very definite condition associated with a special pathology and accompanied by definite clinical symptoms. It is, as we hope to prove, *not a symptom but a clinical entity*, and must be separated once and for all from that conglomeration of clinical material associated with clinical pain, for which the term "menorrhalgia" is more suitable. Much confusion still exists in the literature, owing to the fact that, hitherto, attempts have been made to honour both a symptom and a disease with the same name. To clear the air it must be recognized that although both are common, menorrhalgia is one thing, and dysmenorrhœa another.

We will now state what we regard and teach as being the clinical picture diagnostic of dysmenorrhœa.

Pain usually commences within an hour or two after the first appearance of the menstrual lochia. It is located over the whole of the hypogastric area, but frequently begins in one or both iliac fossæ, and is often described by patients as being of a "tearing character. The actual pain generally lasts for two or three minutes and is followed by by a short temporary remission. The painful waves succeed one another, with slight intermissions, and increase in severity, for two or three hours. In some cases the actual periods of remission are so slight, that the pain is almost continuous and of a tetanic type. At the end of a few hours the pains are less severe and occur at longer intervals, terminating with a local aching which remains for about 6 or 8 hours. There is no sudden cessation of the symptoms such as might be caused by the expulsion of solid material from the uterus, but in other respects the clinical picture has much in common with many early abortions. The severity of the pain frequently causes vomiting, and occasionally signs of mild shock are present, as evidenced by a thin rapid pulse, pallor, and temporary loss of consciousness. During the acute stage the amount of menstrual lochia is small. It increases as the symptoms abate and if the pain has been very severe, the lochia are usually profuse. The characteristic clinical feature about the lochia is that they always contain definite naked eye fragments of tissue which must be distinguished from the small "rat-tail" clots which are also commonly present. The severity of the clinical symptoms varies directly with the size and amount of solid tissue expelled from the uterus during the menstrual abortion. The tissue is usually recoverable in the menstrual lochia on the second or third day of the "function." It is never present in the discharge when the pain is at its height, and will not be found unless adequate precautions are taken to investigate and fix the material available.

Fig. 1. Microscopical appearance of the Menstrual Lochia from a case of normal Menstruation unaccompanied by pain. A Uterine Gland in process of necrosis is shown in the centre of the field. Traces of the stroma undergoing autolysis can be seen in relation to the gland. There is considerable infiltration with Leucocytes. × 350.

UNIV. OF MICH.

Fig. 2. The plate illustrates the different amounts and appearances of solid tissue, either alone, or mixed with blood clot, expelled from the Uterus during four successive Menstrual "periods" in a patient with "non-conceptional Dysmenorrhœa." The varying characters of the material are well demonstrated. At (3) is shown a typical Menstrual "Mole." For details the text should be consulted.

UNIV. OF MICH.

Fig. 3. Structure of one of several "Flakes" of Edometrial tissue present in the Menstrual Lochia on the second day of the "period' from a patient with moderately severe Dysmenorrhœa. The appearance is that of the so-called "pre-menstrual" Edometrium. Note the superficial sub-epithelial hæmatomata, the presence of numerous intact glands and the early Decidual appearance of the stroma cells. There is no superficial necrosis of the tissue such as occurs in normal Menstruation. The whole "flake" is shed. × 105.

UNIV. OF MICH.

Fig. 4. A drawing of a plâque of Endometrium as actually recovered from the Menstrual Lochia in the Vagina, from a patient the subject of severe Dysmenorrhœa. It consists of the Stratum compactum of the Menstrual Decidua, and contains both glands and Decidual cells. × 16.

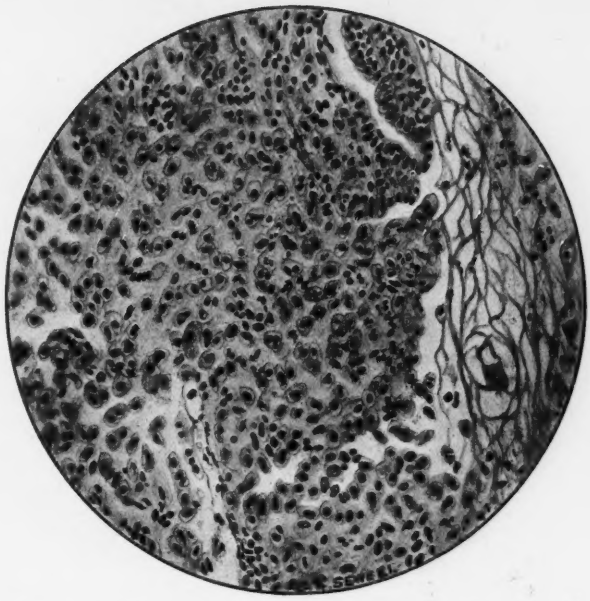


Fig. 5. Drawing to show the detailed structure of the specimen illustrated in Fig. 4. Note the typical Decidual characters of the stroma cells and the deposit of fibrin on the right of the section. There is some infiltration with Leucocytes, but no marked extravasation of the blood. × 350.

Fig. 6. A section of the same specimen showing convolution of the gland ducts and their compression by Decidual cells of the stroma. × 350.

UNIV. OF MICH.

Fig. 7. Section of tissue consisting of Decidua found in the Menstrual Lochia of a patient who complained of severe Menstrual pain, but who was unaware that she was passing anything but "small clots." Both stroma and compressed gland ducts are seen in the section. × 105.

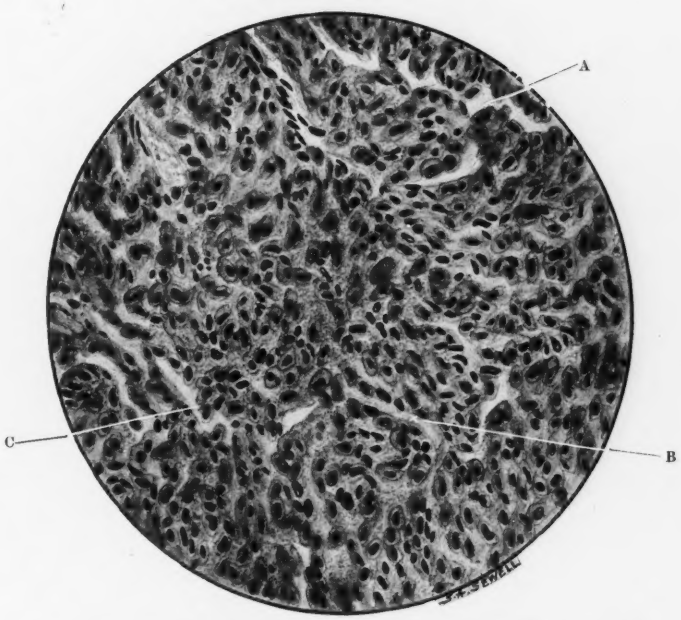


Fig. 8. A drawing from the same specimen under higher magnification showing the typical Decidual character of the stroma cells. The tissue has a similar structure to Fig. 5, but in this case only small flakes of tissue were present in the Lochia. At A, B, & C, are shown glands with the epithelium so compressed that they appear to merge with the stroma. × 350.

UNIV. OF MICH.

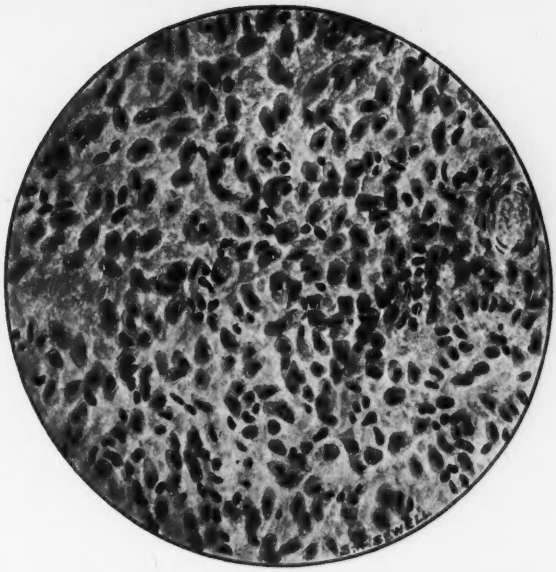


Fig. 9. A drawing of a small "cast" found in the Lochia on the fourth day of Menstruation from a patient who had severe pain on the first day of the function. The Decidual cells are in process of autolysis, giving an early "ground glass" appearance to the section. ×350.

Fig. 10. A section of tissue recovered from the Lochia in the Vagina on the fifth day of Menstruation from a patient with severe Dysmenorrhœa, showing the result of extensive autolysis. The Decidual cells have disappeared and only a few glands remain. There is much infiltration with Leucocytes. The greater part of this section consisted of blood clot only. ×80.

UNIV. OF MICH.

The tissue is friable and must be collected in a fresh state. If retained in the vagina or on the menstrual diaper for any length of time, its features, both maco- and microscopical are lost. The further consideration of this tissue is deferred to a later section.

Relation of Uterine Anomalies to Dysmenorrhœa.

In connection with the association of menstrual pain with the different so-called "types" of uterus, our investigations have brought to light several interesting points.

1. That pain does not occur at every period in the same patient and, even if present, its severity varies within considerable limits.
2. That anatomical anomalies of the uterus, especially of the "hypoplasic" type, *e.g.*, "cochleate" "adolescent" "conical cervix" etc., can, and do, exist without the association of dysmenorrhœa. Also, in patients with uteri of this type complicated with dysmenorrhœa it is quite common for *some* "periods" to be quite painless.
3. That treatment directed to the relief of the uterine anomaly, whether it be a simple dilatation of the cervix, or a more elaborate procedure such as posterior division of the cervix or internal or external hysterotomy is not always followed by permanent relief of the menstrual pain. Even if temtemporarily successful it is by no means uncommon to find that the pain recurs in periods varying from 3 to 6 months.

The types of uteri present in our series of 50 cases are as follows:—

a.	Normal	23.
b.	Cochleate	13.
c.	Adolescent	7.
d.	Conical Cervix	7.

The high proportion of apparently normal uteri associated with severe menstrual pain is interesting. Also is the fact that with abdominal uteri pain is by no means always present, and certainly not at every period. The obvious conclusion is that the importance of the anatomical type of uterus as being a cause of dysmenorrhœa has been exaggerated. The most that can be conceded is that such lesions may be accessory factors in making the pain worse. Our observations do not permit more than this.

Relation of the Nervous System to Dysmenorrhœa.

Observations have also led us to the conclusion that too much stress has been laid upon the so-called "neurotic" tendency

of the patient. By this we do not mean to assert that the "pain sense" has no influence upon the clinical picture. It undoubtedly has, but it is again a secondary consideration only. Investigations, carried out over a series of menstrual periods in the same patient, show that

1. Severe dysmenorrhœa occurs in the stolid apathetic individual just as in the highly strung nervous type.
2. That every period in either type is not painful.
3. That unsuitable occupation and environment are not essential factors in the production of true dysmenorrhœa. They lower the bodily and mental resistance to pain, but do not cause it.
4. That the so-called "neurotic" type occurs much more frequently over the age of 30 in single or sterile women and is the result rather than the cause of prolonged severe menstrual pain.

Women have undoubtedly been led by tradition to expect a certain amount of pain attached to the menstrual function. This fact based upon the phenomena associated with the negative phase undoubtedly obscures the issue. While a large number of women and girls seek advice for severe menstrual pain, many strong-minded individuals put up with the symptoms of true dysmenorrhœa without calling attention to the matter, except to their immediate associates. As examples, we may quote the case of nurses carrying out their duties in spite of severe discomfort. Also in the case of two patients admitted to the medical wards of the hospital it was found that severe dysmenorrhœa existed with physical signs, although these women had never sought advice, under the mistaken impression that the pain was natural and normal. Painful stimuli of any type, whether dysmenorrhœa or otherwise, if repeated, cannot fail in the long run to leave their impression upon the mental state of the individual.

Relation of the Menstrual Lochia to Dysmenorrhœa.

The outstanding feature in cases of true dysmenorrhœa is the presence in the menstrual lochia of solid tissue, visible to the naked eye. Such tissue was found in the discharge of 37 of the 50 cases investigated. In the comparatively mild cases it occurs in the form of small fragments or "flakes." In the more severe degrees of menstrual pain, it occurs as small irregular "plaques," while in the most extreme grades, large pieces of tissue are voided, amounting in some cases to "casts" of the uterus.

Membranous dysmenorrhœa or "exfoliative endometritis" has been known and described since 1779, but we desire to point out

in the present communication that, in our opinion, *this disease is but an extreme grade of what, in lesser degrees, is really a quite common condition.* When the menstrual lochia are systematically examined and care taken in their collection and investigation, all gradations can be detected between the microscopical "ghosts" of tissue present in the normal lochial discharge, and the complete "cast" that is passed in the cases of so-called "exfoliative endometritis." The actual pain varies directly with the amount of solid tissue, and also with the size of the fragments evacuated from the uterus. It is equally important to note that in the same patient, "periods" vary very considerably in the amount of tissue passed. It is quite common, for example, to find that when there has been a large denudation of the menstrual decidua, the following period is often associated with a comparatively slight amount of hæmorrhage and the presence of only small fragments of tissue in the lochia. In other words, when the denudation is extreme the pain is severe and the discharge profuse: when the denudation is fragmentary, both the pain and the amount of discharge are lessened. Fig. 2. (1. 2. 3. 4.) shows the naked eye appearances of the solid material collected from the vagina or from the menstrual pads upon the second or third day of four successive "periods" in the same individual. It will be noted that there are considerable differences in the characteristics of the tissue obtained.

Period (1) associated clinically with considerable pain, produced, several comparatively large fragments of tissue. The succeeding period (2) was marked only by a few shreds and flakes, and pain was slight. At the next period (3) a single solid rolled up mass of tissue was passed on the third day of the period, after a great deal of pain on the first day. The fourth period was the most severe of all as regards the character of pain, and the tissue shown in Fig. 2. (4) was collected by the patient herself from the discharge on the second and third days. This specimen shows both the "thin" and the "thick" types of "membrane" described by Blair Bell, and the fact of the occurrance of both types in the same period and in the same patient indicates that the differentiaton has no great significance.

The uterus in the case of the patient from whom these specimens were obtained was of the "cochleate" type and it is interesting to note that the cervix had been divided and curettage performed upon two previous occasions without more than very temporary relief to the actual pain. The patient had not complained of the passage of any "membrane" and the tissue was discovered only when special attention was directed to the matter.

It has been stated that "casts" of the uterus are of two types, (a) fibrinous or blood 'casts" and (b) endometrial or tissue 'casts."

We believe that there is no real ground for this differentiation and that the pathological basis is the same in each case. This opinion is based upon the following facts. In the first place a patient not infrequently passes both fibrinous "casts" and obvious fragments of endometrial tissue at the same period. Also, if *all* the material passed in the lochia during the period is collected, it is generally possible to detect flakes of tissue even if the greater part consists of blood clot or laminated fibrin. Finally, the proportion of fibrin and tissue has been found to vary within very wide limits at different "periods" in the same individual. Fibrinous casts, in our experience, are much more frequently associated with small fragments of tisue than large. The tissue is often actually incorporated in the clot, and is usually very degenerate and stains badly. Many sections may be required before epithelium can be satisfactorily demonstrated, but we do not think that fibrinous casts are ever produced *in utero* without some denudation of the endometrium. Their formation probably depends upon actual details of the des-quamative process, as for example, the size of the denuded areas, the amount and rapidity of escape of the extravasated blood, and especially the period of retention of the "casts" within the uterine cavity. For these composite "casts", consisting chiefly of fibrin with very little uterine tissue, we suggest the name "menstrual moles". Fg. 2. (3.)

The cause of the menstrual pain appears to be of a two-fold nature viz :— (a) the actual separation of the menstrual decidua *in utero*, and (b) the expulsion of the products of the menstrual abortion from the uterus.

It is generally thought that the second factor is by far the more important, and the idea appears to be ingrained that the cervix uteri exerts a considerable influence in the production of dysmenorrhœa. We are not prepared to accept this thesis in its entirety for the following reasons :—

1. In he first place extreme forms of cervical anomalies exist without causing a patient any menstrual discomfort whatsoever.
2. Operations for the relief of cervical stenosis are not by any means always followed by cure of menstrual pain, when the after histories of patients are carefully investigated.
3. Menstrual pain is usually at its "acme" two hours after the first appearance of the menstrual lochia, but the solid tissue resulting from "decidual necrosis" is not present in the vagina until the 2nd or 3rd day of the function.
4. When the patient is examined while the pain is at its height, evidence of cervical stenosis cannot be found in

all cases even in uteri of the extreme cochleate or adolescent types.

The passage of *simple* blood clots from the uterus is not necessarily associated with pain. As we have previously shown, small clots in the menstrual lochia are so common as almost to be normal. and, in association with various lesions of the uterus and other organs, large clots are commonly voided without any obvious discomfort being produced. The essential factor in the production of pain appears to be associated with the actual separation of the decidual tissue. This tissue acts as a foreign body and induces severe and irregular uterine contractions which, in some cases, appear, from the type of pain to be almost of a tetanic character.

Uterine anatomical anomalies may, and obviously do on occasion, introduce further difficulties in the expulsion of the products of necrosis, but we do not believe that tehir influence is any more important than this.

Microscopical Structure of Tissue in the Menstrual Lochia.

The microscopical appearance of the tissue collected from the vagina in the series of 37 cases of dysmenorrhœa investigated is of considerable interest, in that the material clearly demonstrates a progressive gradation from the normal so-called "pre-menstrual" endometrium to the fully developed decidua resembling that of pregnancy. In Fig. 3 is shown a section which might very well be demonstrated as a curetting from the uterine endometrium on the first day of menstruation. It actually represents the structure of one of several flakes of tissue present in the menstrual lochia on the second day of the period, from a patient with moderately severe dysmenorrhœa. Sub-epithelial hæmotomata are well-marked, both glands and stroma are present, and the cells of the latter show an early decidual appearance especially under high magnification. The hæmatomata are superficial and there is no deep lake of blood which in this instance could account for the separation of the tissue. The number, shape, and size of the glandular elements in this section should be noted, as it has been stated that glands are few in "casts" passed from the uterus.

Fig. 4 is a drawing to scale under low magnification of a plaque of endometrium as passed into the vagina from the uterus. Intense dysmenorrhœa was present on the day preceding the expulsion of this tissue from the uterus. The fragment evidently results from a local and somewhat extensive denudation of the stratum compactum of the menstrual decidua. The tissue shows a number of small compressed ducts of the uterine glands, but is composed mainly of hypertrophic stroma cells. The specimen was recovered

from the vagina and was accompanied by several typical fibrinous blood "casts" of the uterus. These show no very distinctive appearance and are not figured.

Figs. 5 and 6 show the detailed structure of the same specimen. The stroma cells are typically "decidual" in type.. Theglands in Fig. 6 are convoluted, and the manner in which the ducts are compressed by the developing decidua is well shown. There is some infiltration with leucocytes, but no marked extravasation of blood or serum. In Fig. 5 a deposit of fibrin is shown in relation with the decidua and it is easy to understand from these sections how fibrinous and tissue casts of the uterus are really only different aspects of the same process.

Figs. 7 and 8 indicate the microscopical appearances in fragments of tissue recovered from the menstrual lochia in another patient. In this case the actual "flakes" were small and in no sense could they be regarded as "casts." In fact, the patient did not know, previously, that she was passing any solid material at all, apart from what she described as "small clots." The structure of the"flakes," however, reveals a similar appearance to the preceding specimen. Under a lower power (Fig. 7) both stroma and glands are again seen with compression of the ducts by the cells of the "stratum compactum". Under high magnification the "decidual" cells of the latter are clearly indicated. The decidual change is diffuse throughout the section and is not only limited to the areas immediately in relation to the capillaries or lymph spaces. There is no infiltration with serum or blood cells and the "ground glass" appearance descrbed by Blair Bell is absent. In our experience this "ground glass" appearance is not by any means a constant feature in sections of the menstrual decidua obtained from the lochia when *fresh*. It is more commonly observed in the larger fragments or plaques than in the flakes, and results not only from extravasation of blood and serum between decidual cells, but also from tissuet autolysis when the material is retained *in utero*. Large "casts" of the decidua are separated with greater difficulty and retained longer *in utero*. It is only to be expected, therefore, that evidence of autolytic change should be more evident in the large fragments than in the small, which is the case. We regard the "ground glass" appearance, therefore, merely as evidence of degeneration and not as being of great pathological or diagnostic importance.

Fig. 9 shows early "ground glass" degeneration of the decidual cells in a small "cast" of decidua passed by a patient on the fourth day of the menstrual abortion after considerable pain during the early stages.

Occasionally tissue is passed from the uterus towards the end of a period when degeneration of the decidual cells has progressed to an extreme degree, and only a few glands remain to show that the material was originally of endometrial origin. This is well seen in Fig. 10 which shows marked infiltration of the degenerated decidual "areas" with leucocytes. A few compressed and degenerate glands are scattered throughout the field.

A consideration of the total pathological material available from the series of cases investigated has led us to the conclusion that it is unnecessary to describe what has been termed the "decidual reaction" of the stroma cells of the endometrium. The *tissue is undoubtedly true decidua* and identical with the decidua of pregnancy, whether uterine or ectopic. It is possible to trace its gradual development, and the atypical appearances which have been described, are due to degenerative changes with, and sometimes without, extravasation of blood incidental to the conditions of separation at the menstrual epoch.

Relation of the Corpus Luteum to Dysmenorrhœa.

As a result of these investigations we have come to the conclusion that the pathological basis underlying the majority, if not all cases of true dysmenorrhœa as distinct from menorrhalgia is an *exaggeration of the positive menstrual phase*. A reference to the observations previously made on the physiology of the menstrual function shows that this implies either *hyperactivity on the part of the corpus luteum or a high vitality of the unfertilized ovum*. Excess in either amount or degree of the luteum hormone which normally stimulates decidual growth is the probable cause of the precocious development of the decidua. When this occurs the clinical symptoms associated with the negative phase will naturally be exaggerated. Death of the unfertilized ovum and degeneration of the too active corpus luteum will be followed, not by the crumbling necrotic process of normal menstruation, but by a wholesale disintegration of the hyperplasic menstrual decidua. This is accompanied by the clinical phenomena previously described, for which we suggest the name of "nonconceptional dysmenorrhœa." This we regard as being a more suitable term based upon pathological principles to replace the variety of names which occur in the literature. The terms "spasmodic," "obstructive," "exfoliative," and "membranous," in connection with menstrual pain should, we think, be discontinued. They mean very little and are based upon a wrong conception of the true pathology of the condition.

The classification by Blair Bell of dysmenorrhœa into "extrinsic" and "intrinsic" is good if the word "dysmenorrhœa"

is used in the sense of a *symptom* only, viz., "painful menstruation." For reasons stated above, we prefer to substitute Massey's term "menorrhalgia" for the symptom, and in this sense the terms "extrinsic" and "intrinsic" may be used. The word "dysmenorrhœa," meaning "difficult menstruation," should, in our opinion, be reserved for the clinical and pathological entity described in this paper. There is indeed only one type of dysmenorrhœa, but if it is thought necessary to qualify the term in any way, we think that the suggested word "nonconceptional" is the most appropriate as indicating the relationship which the condition bears to the sex cycle and to its pathology.

Therapeutic considerations cannot be discussed in the present communication. It is reasonable to suggest, however, that the problem of the treatment of dysmenorrhœa must be attacked in another manner different from the common practice to-day. Operations upon the uterus, such as hysterotomy or cervical dilatation and division with curettage, should be regarded as palliative measures only. The real object to be attained, if possible, is inhibition of the positive menstrual phase. Theroretically, this might be achieved by the inhibition of ovarian activity with X rays or radium. It appears possible also that therapeutic degeneration of the corpus luteum might be produced by extracts of the early developing ovum. If such means as these can be found to antedate the menstrual abortion, then the problem of successful treatment in relation to dysmenorrhœa appears to be capable of solution.

CONCLUSIONS.

1. Nonconceptional dysmenorrhœa should be sharply defined as a clinical and pathological entity, in contradistinction to menorrhalgia which is a symptom only implying painful menstruation.

2. Nonconceptional dysmenorrhœa is always associated with the expulsion of tissue from the uterine cavity, either in the form of flakes, plaques, or casts.

3. The severity of the pain is directly dependent on and proportionate to the degree of denudation of the endometrium and to the size of the fragments expelled from the uterus.

4. It is dependent only in a secondary sense upon the anatomical conformation of the uterus and the nervous control of the individual.

5. The tissue expelled from the uterus in the menstrual lochia consists, usually, of hyperplasia decidua. It may, or may not, be associated with fibrin, and the proportion of each constituent varies in different cases. The classification of uterine casts into fibrinous and tissue appears to serve no useful pathological purpose. The distinction is one of degree only.

6. So-called membranous dysmenorrhœa or exfoliative endometritis is merely an extreme degree of a comparatively common pathological condition of the menstrual decidua.

7. Hyperplasia of the menstrual decidua is probably the reflection of excessive lutein activity or high vitality of the ovum. Nonconceptional dysmenorrhœa is, therefore, an exaggeration of the positive menstrual phase and is due to precocity in decidual development. It appears to imply a hypertonic sex impulse, which in due course tends to become exhausted.

8. The aim of treatment should be to initiate an early negative phase by inducing degeneration of the corpus luteum. Operations upon the uterus can be regarded only as palliative in the relief of pain associated with nonconceptional dysmenorrhœa.

REFERENCES.

Bell, Blair, and others. Report upon Discussion of "Dysmenorrhœa," *Journ. Obstet. and Gynæcol.*, vol. xxx, No. 2.

Bell, Blair. "New System of Gynæcology" (Eden and Lockyer), 1917.

Novak, Emil. "Menstruation and its Disorders." (Appleton & Co.) 1921.

Whitehouse, Beckwith. *Lancet*, 1914 and 1926. Encyclopædia of Midwifery and Diseases of Women (Fairbairn), 1921. Oxford University Press. "New System of Gynæcology" (Eden and Lockyer), 1917.

Endometrial Tumours of Laparatomy Scars.*

By G. W. Nicholson, M.A., M.D., B.Ch. (Cantab.).

Morbid Histologist, Guy's Hospital.

Endometrial tumours, or "endometriomata" as they are generally named, are of the greatest interest for pathologists as well as gynæcologists. They have a wide distribution in the abdomen and its walls. They are restricted to adult females. They are not found in children. The rare cases recorded in old women are typical in structure and clinical features, and can be explained as atrophic remnants of these tumours which have undergone involution with the organs of generation after the menopause.

Our knowledge of the histogenesis and ætiology of endometrial tumours is in a very unsatisfactory state. To be honest, our ignorance is profound. As so often in pathology, we are confused and deceived by the theories propounded to explain them. We do not know, in the first place, if these anomalies are true tumours and blastomata, or instances of hyperplasia and attempts at compensatory regeneration. Again, we are ignorant of their tissue of origin, and do not even know if it be the same in all the situations in which they arise, or if it vary in different parts of the abdomen.

The endometrial tumours of laparotomy scars are of interest, and perhaps of importance in helping to throw light on this whole group of disorders, in that they, as their name implies, are always found in the newly formed or adventitious tissues of scars. They are rare, and I append abstracts of the chief cases recorded in the literature.

Meyer[11] describes the first case in a woman aged 35, who had been operated two years previously for ventri-fixation of the uterus and removal of the right adnexa. A painful nodule developed in the scar below the umbilicus. Excision of scar. Fundus uteri firmly attached to tumour and omentum adherent between uterus and abdominal wall. Removal of tumour together with attached part of fundus and omentum. Fundus found to be attached to abdominal wall by a "mesentery" about 5 mm. in length. *Histology*: Skin atrophic without cutaneous appendages.

* This paper is based upon the writer's "Studies on Tumour Formation, XI. *Guy's Hos. Rep.* LXXVI. p. 188, 1926.

Tumour consists of dense scar tissue with tubules and cysts and cellular stroma. Hæmorrhages and blood pigment. Only one cyst extends for short distance into "mesentery." Near here there is a "silkworm" thread, surrounded by cysts, tubules, and cellular stroma. No epithelial elements in excised part of uterus or omentum. Klages'[5] case concerns a middle aged woman who had been operated upon six years previously for ventri-fixation of the uterus and removal of the right adnexa and the vermiform appendix. A tumour made its appearance in the lower part of the scar four years later. It assumed a red colour and became very painful at the menstrual periods. Scar ascends in linea alba for 10 cm. above pubes. Its lower end contains a reddish, firm, tender nodule, of about the size of a walnut, and raised slightly above level of surrounding skin. Excision: Tumour produced into a stalk, which traverses peritoneal cavity and is attached to anterior wall of uterus and adherent to a tag of omentum. *Histology*: Radiating bands of dense fibrous tissue. Narrow bundles of plain muscle, most numerous at base of tumour. Large and small cysts and tubules, partly surrounded by inflammatory granulation tissue and partly by cellular stroma. Hæmorrhages. v. Franque[3] examined a V-para aged 39 upon whom a laparotomy had been performed four years previously for suture of a perforated uterus due to criminal abortion. A short time later a tumour was noticed in the lower part of the scar, which attained the size of a walnut during the last six months. Excision: Tumour only slightly movable, covered by pigmented skin. Enclosed in subcutaneous fat, but produced inwards for a distance of about 3 cm. as a wedge-shaped cicatricial mass, which contains punctate black and yellow areas. Not connected with peritoneum. *Histology*: Tubules and cysts. Cilia and goblet-cells. Cellular stroma. Hæmorrhages and pigment.—Fraas[2] saw a woman, aged 45, in whom ventri-fixation of the uterus had been performed twenty years previously. Scar on the left of middle line, 5 cm, in length, retracted. Its lower end very firm. Excision of scar, which is firmly adherent to the fundus of the greatly elongated uterus by means of dense scar tissue. Hysterectomy. *Histology*: Dense scar tissue containing cysts and "uterine" glands. These are present only in scar and adherent parts of surface of uterus, whereas they are absent in the myometrium and are therefore independent of the endometrium. No adeno-metritis of the uterus. —Cullen[1] describes adeno-myoma of the rectus muscle. A laparotomy had been performed on the patient, a woman aged 34, nine years previously for rupture of the uterus following an abortion. A year later she gave birth to a full-time child. Menstruation normal. A few days before admission she noticed a

small tender nodule in the rectus abdominis muscle, on the left of the middle line, under the lower end of the scar, but not attached to it. Operation: Tumour, 3 cm. in length, excised. Firm and fibrous, mottled, unencapsulated. *Histology*: Unstriped muscle with areas of typical uterine mucous membrane. Blood and pigment.—Mahle and McCarty[10] describe three cases. (1) Woman aged 30, with a small tumour of the lower end of a laparotomy scar of two years duration. Painful at periods. Operation: Tumour attached to the left Fallopian tube about four cm. from uterine horn. *Histology*: Adeno-myoma. (2) IX-para aged 46. Last pregnancy ten years ago. Ventri-fixation of the uterus several years ago. Tumour present in scar for about a year. Painful at periods. Operation: Tumour situated in abdominal wall above symphysis pubis, 8 cm. in diameter, firmly attached to right side of uterus. Since it infiltrated the retro-peritoneal tissues and was apparently inoperable, only a piece was excised for histological examination. Tumour firm, with pigmented glandular and cystic areas. *Histology*: Adeno-myoma. (3) This specimen is described by these authors as a tumour of the groin together with their tumour of the round ligament. It clearly belongs to the group now under discussion. An unmarried woman, aged 50, in whom an appendicular abscess had been drained twenty-five years previously. Two small nodules appeared in the scar four years before admission. They were painful at the periods. Excision: The tumour occupied the scar and extended downwards to the femoral ring. An inguinal hernia and fibroids of the uterus were present. *Histology*: Adeno-myoma.—Lauche[8] collected four cases. (1) Unipara, aged 30. Laparotomy for double pyosalpinx and ventri-fixation of uterus of four years standing. Soon after she noticed a thickening of the lower end of the scar. Vesicles appeared here at the menstrual periods. Latterly they have discharged blood-stained fluid at these times. Operation: Tumour, which contains many isolated cysts, extends as far as peritoneum, but not beyond it. No direct connection with uterus. *Histology*: Dense bundles of scar tissue. Branched tubules and cysts with cellular stroma. Blood and pigment. Areas of round-celled infiltration. Bundles of twisted and knotted fibres of unstriped muscle. Peritoneum not present in sections. (2) Age 35. Only pregnancy eleven years previously. Ventri-fixation of uterus two years before admission. Right adnexa found to be adherent to uterus. Cystic left ovary removed. Periods painful since then. A tumour made its appearance in the scar. It increased in size at the periods. Excised together with piece of peritoneum. Structure of abdominal wall obliterated, replaced with scar tissue with brownish cysts. Tumour connected with fundus uteri, a part of the surface of which

was excised. *Histology*: Same as that of first case, except for absence of unstriped muscle. (3) Age 37. Several abortions. Operation on ovaries thirteen years previously. Since then three normal pregnancies, the last four years ago. For past six years pain in scar and dysmenorrhœa. Operation: Excision of thickened lower end of laparotomy scar, which contains blood-stained cysts. Peritoneum opened. Dense adhesions between stump of left adnexa, removed at first operation, and scar. *Histology*: See first case. No unstriped muscle present. (4) Unmarried woman aged 26. Periods always irregular. Laparotomy for tumour of ovary and ventri-fixation of the uterus four years ago. Tumour of lower end of scar for six months. Painful and enlarged at periods. Operation. Tumour under abdominal fascia. Not connected with peritoneum, which was not opened. Uterus adherent to abdominal wall *Histology*: Similar to that of first case. Small round isolated areas of unstriped muscle.—Tobler[19] records five cases. Four of them concern women aged 22, 25, 41, and 32 respectively, two of whom had undergone tubal sterilization two years previously, and a third a laparotomy for a tubal pregnancy twelve years ago. A small hernia was present in the scar in the last case. A tumour of the cicatrix was present for a year and a half, two years, and eighteen months respectively. It had given rise to pain at the periods. Tobler's last case concerns a woman aged 30, who had a tumour, 1 cm. in diameter, in the scar of a suppurated appendicectomy wound made six years previously. It contained minute brownish cysts. *Histology*: Dense scar tissue Islands of endometrial tissue with cysts and tubules. Blood and pigment. No plain muscle present. In the case associated with a hernia the tumour was attached to the apex of its sac. The tubules are continuous at several spots with the peritoneal epithelium.—Lochrane[9] operated upon a II-para aged 38, whose younger child was twelve years of age. Four years previously a laparotomy was performed for "displacement of the womb," and a tumour was noticed three years later in the scar. "It swells and gets very sore and tender at about the time of the periods." Menorrhagia and severe dysmenorrhœa since the last confinement. Operation: A diffuse, fibrous-looking mass, with ill-defined margins, under fascia of right rectus muscle in laparotomy scar. Shut off from abdominal cavity by the peritoneum only. Honeycombed with small cysts with thick dark menstrual-like fluid. The remains of two or three old catgut sutures are present in it. Anterior wall of the uterus, near fundus, attached to the site of the tumour by a narrow band consisting apparently only of peritoneum. Right ovary adherent to uterus, enlarged, and contains a hæmorrhagic cyst. *Histology*: Islands of endometrium imbedded in fibrous

scar tissue. Epithelium apparently ciliated in places. No mention of plain muscle.—Lemon and Mahle[8] record nine cases of "post-operative invasion of the abdominal wall." (1) Aged 46. Ventri-suspension. Tumour of laparotomy scar, midway between umbilicus and symphysis pubis, connected with fundus uteri and extending down into the right side of abdomen. Noticed for one year. (2) Aged 35. Ventri-fixation of the uterus four years previously. Hard irregular mass attached to fundus uteri below laparotomy scar. (3) Aged 38. Suspension of uterus. Mass in scar, adherent to fundus, painful at periods. (4) Aged 43. Ventri-fixation of the uterus twelve years previously. Hard irregular mass under scar. Fundus densely adherent to abdominal wall below it. (5) Aged 30. Shortening of uterine ligaments for prolapse five years ago. Mass in lower part of scar, attached to left Fallopian tube $3\frac{1}{2}$ cm. from uterine horn. (6) Aged 27. Salpingectomy four years previously. Operation for adhesions two years later. Mass in scar, adherent to fundus uteri. (7) Aged 36. Ventri-fixation three years ago. Tumour of lower end of scar, noticed soon after. Intermittently discharged bloody fluid. Not connected with uterus. (8) Aged 40. Hysterectomy and oöphorectomy six years previously. Mass in scar. (9) Aged 35. Double salpingectomy, right oöphorectomy, and appendicectomy nine years previously. Tumour of scar noticed six years later. Painful and enlarged at periods. Extended to peritoneum with omentum adherent to its inner surface. Not connected with uterus. *Histology*: Adeno-myomata. Fibrous tissue. Islands of endometrium. Epithelium occasionally ciliated. Hæmorrhages, blood pigment. Signs of inflammation. Smooth muscle present. First case contains miliary tubercles. Sections through fibrous bridge between tumour and fundus uteri when it was present, contain no glandular tissue.—Vassmer[20] saw an unmarried woman, aged 24. Ventri-fixation of the uterus four years previously. Two catgut sutures were passed through fundus, but its cavity had almost certainly not been entered. Since then periods painful, with a bloody discharge from a small nodule in the scar. Excision followed by recurrence of tumour. Second excision Fundus attached to scar by a band. *Histology*: Scar tissue. Islands of uterine mucosa, the tubules of which extend to skin and communicate with the surface. Separated from peritoneum by a layer of skeletal muscle. The band is built of plain muscle, etc., typical of the round ligament and uterus, and contains no epithelial structures.—Rosenstein[16] saw an immovable firm tumour of a laparotomy scar, at about its middle between umbilicus and pubes, in a woman aged 23, who had undergone an operation for resection of both Fallopian tubes and ventri-fixation of the uterus five years previously. *Histology*: Scar tissue containing several "silk-

worm" threads. Tubules and cysts. Cellular stroma relatively scanty.Blood and pigment. No plain muscle.

I have described[14] a case of an unmarried woman, 36 years of age, who had a colotomy and laparotomy performed two years previously for what she believes to be a suppuration in the pelvis. Both openings have since closed. Lately she has noticed a tumour, 2 cm. in its greatest diameter, in the lower end of the laparotomy scar. It is painful and increases in size at the menstrual periods, at which times she also complains of hæmorrhage from the bowel. The tumour was excised. It lay under the rectus sheath; its edges were ill defined. It did not extend as far as the peritoneum. It was firm and consisted of strands of fibrous tissue, in which a few brownish cysts were scattered. The uterus was not attached to the anterior abdominal wall. *Histology*: The tumour consists of very dense and non-cellular fibrous tissue, which is often wrapped about groups of thick-walled blood vessels, held together by hyaline envelopes of their own. The general fibrous tissue has undergone hyaline degeneration in many places. Plain muscle is entirely absent, but a good many fibres of skeletal muscle are visible, especially near the periphery of the tumour. The islands of endometrium are large and irregular. The tubules are large but few in number. Many are cystic. The stroma is generally non-cellular and fibrillar. It contains many thick-walled arterioles and dilated veins. The looser parts of the fibrous tissue and, to a lesser extent, the endometrial stroma are infiltrated with leucocytes. There are no fresh hæmorrhages and only a few small deposits of hæmosiderin in the stroma. The tubules are empty. The edges of the tumour are ill defined. Its fibrous strands are lost in the surrounding areolar tissue.

These tumours of laparotomy scars can be summarized thus: They are always found in adult women, between the ages of 22 and 50, with an average age of 36. They are usually associated with disturbances of menstruation, at any rate since the tumour was first noticed. The laparotomy in the scar of which the tumour developed had been performed as long as twenty-five years, or as recently as two years previously. The tumour was noticed after an interval of from a few weeks to twenty-one years. Increase in size of the tumour and pain at the periods are mentioned often, and were accompanied by a discharge of bloody fluid from its surface in three cases, described by Lauche,[6] Lemon and Mahle[8] and Vassmer.[20]

It is a remarkable, but unexplained, fact that endometrial tumours of laparotomy scars are restricted to the lower half of the abdominal wall. Their highest point is the umbilicus.

These tumours can be grouped in accordance with the nature and purpose of the original operation.

Group 1: Ventri-fixation of the uterus. Fifteen cases, namely those of Meyer,[11] Klages,[5] Mahle,[2] and McCarty[10] (Case2), Lauche[6] (Cases 1, 2, and 4, Lochrane,[9] Lemon and Mahle[8] (Cases 1, 2, 3, 4, 7), Vassmer,[20]and Rosenstein.[19] In all these, with the exception of Lauche's[6] first case and of Lemon and Mahle's[8] seventh case, the uterus was found to be adherent to the anterior abdominal wall. The peritoneum or omentum is stated to have been involved in the cases of Meyer,[11] Klages,[5] Lauche[6] (Case 2), and of Lemon and Mahle.[8] In those of Lauche[6] Cases 1 and 4), Lochrane,[9] Vassmer,[20] and Rosenstein[16] it was not implicated.

Group 2: Operation for perforation or rupture of pregnant uterus. Two cases, those of Franqué[3] and Cullen.[1]

Group 3: Hysterectomy. One case, the eighth of Lemon and Mahle.[8] Nevertheless this case is included by these writers in those due to "post-operative invasion of the abdominal wall" by endometrium.

Group 4: Operations on the Fallopian tubes or ovaries without hysterectomy. Six cases. Sterilization had been performed in two of Tobler's[19] cases, and an operation for a tubal pregnancy in a third. In Lauche's[8] third case the left adnexa were amputated. Its stump was found to be firmly adherent to the laparotomy scar. Salpingectomy had been performed in two of Lemon and Mahle[8] cases. In the first of these the cicatricial tumour was adherent to the fundus uteri, and in the other to the omentum.

Group 5: Operations upon the uterine ligaments. One case, the fifth of those of Lemon and Mahle,[8] in which the ligaments had been shortened for a prolapse of the uterus. The tumour of the scar was found to be adherent to the left Fallopian tube.

Group 6: Appendicectomy. Two cases, the third of Mahle and McCarty[10] and the fourth of Tobler.[19]

Group 7: Uncertain. The case recorded above[14] in which laparotomy and colotomy had been performed for "suppuration of the pelvis."

We see that of twenty-eight cases for which *data* are available, only fifteen had undergone ventral fixation of the uterus. In two of the remainder the operation had to do with the vermiform appendix and not the internal organs of generation.

The naked-eye and histological structure of these tumours of scars is identical with that of those of the groin and umbilicus, and need not be summarized. It corresponds with the uterine

mucosa, and there is plenty of evidence of participation in the menstrual function.

We have seen that the peritoneum was implicated by the tumour in several instances. Tobler,[19] indeed, demonstrates histological continuity between the peritoneal epithelium of the hernial sac, to which the tumour was attached, and its tubules.

Unstriped muscle was present in the cases of Klages,[5] Cullen,[1] Mahle and McCarty,[10] Lauche[6] (Cases 1 and 4), and Lemon and Mahle.[8] In Cullen's specimen it formed the bulk of the connective tissue, and in those of Lauche it was present as isolated whorls and knots.

Meyer,[11] Lemon and Mahle[8] (five cases), and Vassmer[20] state that, upon histological examination, no epithelium was found to be present in the band connecting the uterus with the abdominal scar after ventri-fixation. Fraas[2] on the other hand, found tubules and cysts in the adhesions, but emphasized that they barely extended below the surface of the uterus and were not present in the myometrium. He performed a thorough examination of the amputated uterus. In Lauche's[6] second case the tumour was adherent to the surface of the fundus, but the area was not indentified with the miscroscope. Anatomical continuity between the epithelium of the uterine mucous membrane and that of the tumour has therefore not been established in one single case.

Endometrial tumours are explained with the help of one of three theories. It is assumed that the tumour arises either in a "cell-rest" which was displaced in development, or in a fragment of endometrium displaced in adult life, or by proliferation and change of type of epithelial cells of the peritoneum.

Embryonic theory.—The principal fœtal structures that are invoked to explain endometrial tumours of the abdominal wall are the remains of the vitelline duct and urachus at the umbilicus, and those of the Wolffian body in other situations, especially the groin. We can dismiss the first two of these at once, since they are endodermal structures. The uterine mucosa is a product of the mesoderm. It is no more than a wild speculation to assume, upon no evidence whatever, that the endoderm gives rise to a typical mesodermal tissue.

With regard to the Wolffian body, it may be said that bits of it have been described in the embryo at or near the spot at which the inguinal canal is to be developed. There is not the slightest evidence that its tubules are present in other parts of the anterior abdominal wall. It is conceivable that endometrial tumours of the groin originate in Wolffian remnants, as well as those within and close to the broad ligaments, in which Wolffian tubules normally persist. But to assume that other intra- and extra-peritoneal

endometrial tumours are Wolffian in origin is contrary to the known facts of embryology. It is impossible for these tubules to stray to the umbilicus or to the intestines, except possibly in the very grossest and most monstrous malformations. And to believe that these "rests" happen to be present at the spot at which the laparotomy scar is subsequently formed and that they are included in it, is childish credulity.

There is no evidence that tumours which we can demonstrate to have arisen in fœtal rudiments are more common than those in the genesis of which no such anomaly need or can be assumed. Again, all the evidence we possess points at the conclusion that remnants of fœtal organs, where and when present, undergo differentiation and are therefore not disposed for tumour formation to a greater extent than other tissues. To assume, as is generally done, that *displaced* tissues are predisposed for tumour formation is simply the result of entire ignorance of embryology, since most of the assumed displacements are not only non-proven, but, as shown by R. Meyer[12,13] long ago, actual physical impossibilities.

Nor is there a real proof that the epithelium of persistent remnants of the Wolffian body is ever differentiated into uterine epithelium. Even when endometrial tumours are found at the exact spots where its remnants normally persist, no proof has been brought forward that the one originates in the other. The whole of v. Recklinghausen's[15] hypothesis of the origin of "adenomyomata" is based on inference unsupported by definite evidence. Again, endometrial tumours are unknown in the kidneys which, when everything is said and done, are developed from the same blastema as the Wolffian body.

To ascribe the presence of an endometrial tumour at a given spot to an undefined and undefinable "abnormal predisposition" of this spot is futile, and no more than an attempt to explain one unknown factor in terms of another equally unknown.

Displacement theory.—We owe this theory, which is too well known to need description here, to the ingenuity of Sampson[17,18]. But what evidence is there, except that inferred from the presence of the tumour, that viable fragments of endometrium desquamated at a menstrual period reach the peritoneum and settle on its surface? Again, are Sampson's arguments supported by biological *data*? Is not *contra rerum naturam* for the currents within the Fallopian tubes to be so easily reversed? Is it not inconceivable, especially when we bear in mind the ultimate fate of transplanted tissues in general, that semi-necrotic desquamated cells, the physiological fate of which is to die, should not only settle and grow in a foreign situation with great regularity and ease, but proliferate with a vigour vastly in excess of that of the endometrium? In

spite of Sampson's assumed "intermediary host, hotbed, or incubator," I submit that this is inconceivable. Whatever the cells in which these tumours originate, they must be viable, active, vigorous cells.

Lauche[7] justly remarks that the ultimate proof of the correctness or otherwise of Sampson's theory will be given by experiments with apes. We still await these, since those of Jacobson[4] were performed with curettings and not with fragments desquamated naturally at a menstrual period, and therefore teach us nothing we wish to know.

Even the most whole-hearted supporters of Sampson's theory cannot very well apply it in its original form to the tumours of laparotomy scars, since they have no evidence that the operation was performed at a menstrual period. And once the wound is covered with granulations, these would most certainly destroy a fragment of endometrium implanted on them at the next period. The theory has thus been modified by the assumption that the needle used in placing the deep sutures at the operation had perforated the uterine cavity and torn away a fragment of endometrium and implanted it in the laparotomy wound. But what evidence is there of this want of skill or care on the part of the operator? I notice, indeed, that several of the writers who advocate this theory—and it is pretty generally held by British and American gynæcologists—are careful to make it perfectly evident that the original operation was not performed by themselves. It is obvious, of course, that accidents will happen, and that even the best surgeon might wound the endometrium, but I submit that reasonable evidence must be produced that it actually did happen. Unsupported assumptions are not working hypotheses, although the two are often confounded.

Is it probable that a needle, however large it be, provided it have a point, even a very blunt one, would tear fragments of tissue away from their surroundings and push them for considerable distances? This is as improbable as with the smallest needles. The case is entirely altered should the point be broken off, for then a rough surface would result, which would be an admirable agent for laceration and transport. Although I cannot speak from personal experience, I am unable to conceive of even the most careless and inefficient surgeon stitching the uterus to the abdominal wall with a broken needle.

And should a fragment of endometrium be torn away and adhere to the needle or ligature, would it not be arrested almost at once—in the deeper layers of the myometrium—by the resistance and friction offered by this tissue to its progress? Surely the opposite should happen from what we know actually takes place.

The most frequent site of these implants should be in the uterine wall, the next under the peritoneum, and the least in the laparotomy scar. We cannot even presume a "predisposition" to account for this anomalous behaviour, since endometrial tumours are infinitely commoner in and on the uterus than in laparotomy scars. And that displacement alone predisposes for tumour formation and the further the tissue be removed from home the more likely it is to flourish is an exploded notion, as I have indicated above.

Peritoneal theory.—This assumes that the epithelial cells of the peritoneum, when they proliferate in response to an irritation, the nature of which is unknown, undergo differentiation *in situ* into uterine epithelium. Although there is not very much nor very conclusive evidence in its favour, it is applicable to certain cases at least and, which is of great importance, compatible with biological facts. It is the best theory hitherto devised to account for endometrial tumours of the intestines and peritoneal surface of the uterus and its adnexa, and applies to those of the umbilicus, the groin, and laparotomy scars. It will be well to review the evidence in its favour.

(a) *Direct evidence.*—It has been shown in a good many intra-abdominal tumours that they permeate the wall of the gut, uterus, etc., from without, and in several cases direct histological continuity has been established between the peritoneal epithelium and that of the tumour. This applies, as we see, to Tobler's[19] tumour of a laparotomy scar.

(b) *Biological evidence.*—We must—at least those of us who are pathologists—take an epigenetic view of development and differentiation, and assume that an organ is produced in its normal situation, and nowhere else, because its cells are subjected to a long sequence of appropriate stimuli only at this spot, the cumulative effect of which is the assumption of the corresponding physiological structure. Thus, endometrium is produced only at one spot, not because the epithelium or other parts of the cœlom of the embryo is incapable of undergoing differentiation in this direction, but because the environment, to which it is the response, directed this change here, and nowhere else, throughout embryonic life. Although it is inconveivable that endometrium could be preduced in other parts of the peritoneum in development, it is a matter of experience that it never is, since accessory ducts of Müller are not found except in the immediate vicinity of the principal ducts, and endometrial tumours are unknown in embryos and children. Until these things have been demonstrated in them, it is contrary to experience to assume that the tumours in

women originate in congenital accessory uteri or congenitally predisposed cells. To the best of our knowledge *the tumour is always acquired*. It is something new. It follows from this that there is not the slightest evidence that its cells of origin were not, at one time, perfectly healthy, normal cells.

(c) *Pathological evidence.*—Since, as I have attempted to show, the structure ultimately assumed by the cells depends largely upon the influence of their environment, it follows that, should the latter change, the former may undergo a corresponding change. Evidence is steadily accumulating that this actually happens in many pathological states. Examples are heterotopic bone formation and metaplasia of epithelium. There is no *a priori* reasons why every differentiation undergone in development by the tissues of the embryo should not be repeated during the whole life of the individual in pathological states. Since the endometrium arises in the cells of the cœlom, the peritoneal cells of the adult may well produce endometrial epithelium again if they be subjected to a suitable abnormal environment. I believe this conclusion to be sound and unassailable, since it is backed by good evidence. Our great and, at present, insurmountable difficulty, when we apply it to endometrial tumours, is that we have no idea of the nature of the environment changes. We know that the alteration of type or metaplasia depends upon an influence exerted by the functioning ovaries, since endometrial tumours are absent in males and sexually immature females. Again, we know that the alteration is associated with proliferation of the peritoneal epithelium and a mild degree of inflammatory reaction. But we do not know if the proliferation be a response to an inflammation or of the nature of a compensatory regeneration, a possible attempt at balancing a defective uterine secretion.

This state of uncertainty is mainly responsible for the differences of opinion as to the status of these anomalies, whether they are to be regarded as regenerations or true tumours. For it must be admitted that, in our ignorance of tumour formation, we are inclined to call every nodule of new tissue a tumour when we cannot find a cause for its presence, and a regenerative hyperplasia when we can associate it with a causative agent. Without entering into this question in detail, I personally regard endometrial tumours—together with many, if not all neoplasms—as partaking of the nature of both. They are clearly hyperplasias or accessory uteri in the perfection of their histological structure and the performance of the physiological functions of the endometrium, *e.g.*, menstruation and decidua formation. They are tumours in their often isolated and independent mode of growth

and the assumption of irregular shapes. For me they are important links between the physiological tissues and the tumours. I have named them "endometrial" in this paper because they are structurally and functionally identical with the endometrium, and "tumour" simply in the original connotation of the word, which means no more than a swelling or lump.

I have not discussed the typical "endometrial" stroma of these tumours nor the plain muscle in them, since the presence of these structures is readily explained when we admit that the epithelium has become truly "endometrial." It is a well known fact that the epithelia in normal development and pathological growth exert an influence on the cells of the mesenchyme with which they happen to be in contact, and make these assume a corresponding structure. I therefore regard the stroma and muscle of these tumours simply as local mesenchyme cells or connective tissue corpuscles, altered and metamorphosed by the "endometrial" epithelium into "uterine" mesenchymal tissues.

Conclusions :— 1. Endometrial tumours are acquired accessory uteri.

2. Of the theories which attempt to explain them the *"peritoneal"* is the most generally applicable, and its acceptance offers the fewest difficulties. It alone agrees with biological facts.

It has been suggested that desmoid tumours of the abdominal wall are in reality endometriomata. I regard these tumours as fibro-sacromata that have the peculiarity of at first appearing as fibromata and recurring time after time as more malignant sacromata. They are equally common in both sexes, have no connection with a scar and have nothing to do with endometrial tumours.

REFERENCES.

1. Cullen. *Arch. of Surg.*, 1920, i, 215.
2. Fraas. *Zbl. f. Gyn.*, 1919, xliii, 750.
3. v. Franque. *Zbl. f. Gyn.*, 1916, xl, 953.
4. Jacobson. *Arch. of Path.*, 1926, i, 169.
5. Klanges. *Ztschr. f. Gebh. u. Gyn.*, 1912, lxx, 858.
6. Lauche. *Virchow's Arch.* 1923, ccxliii, 298.
7. Lauche. *Cbl. f. allg. Pats. u. path. Anat.*, 1924, vxxv, 676.
8. Lemon and Mahle. *Arch. of Surg.*, 1925, x, 150.
9. Lochrane. *Journ. Obstet. and Gyn. Brit. Emp.*, 1923, xxx, 213.
10. Mahle and McCarty. *Journ. Lab. and Clin. Med.*, 1920, v, 218.
11. Meyer. *Ztschr. f. Gebh. u. Gyn.*, 1903, xlix, 32 .
12. Meyer. *Erg. d. allg. Path.* 1905, ix, ii, 518.
13. Meyer. *Erg. d. allg. Path.* 1911, xv, i, 430.
14. Nicholas. *Guy's Hosp. Rep.*, 1926, lxxiv, 188.

15. v. Recklinghausen. "Die u. Cystadenome d. Uterus d. Uterus u. Tubenwandung., Berlin, 1896.
16. Rosenstein. *Monatsschr. f. Gebh. u. Gyn.*, 1995, lxx, 197.
18. Sampson. *Arch. of Surg.*, 1922, v. 217.
17. Sampson. *Arch. of Surg.*, 1921, iii 245.
19. Tobler. *Frankfurter Zeitschr. f. Path.*, 1923, xxiv, 558.
20. Vassmer. *Arch. f. Gyn.*, 1925, cxxiii, 187.

Why has the Teaching of Midwifery been so Inefficient.*

By Comyns Berkeley, M.C., M.D. (Cantab.). F.R.C.P. (Lond.).

Senior Obstetric and Gynæcological Surgeon, The Middlesex Hospital.

When The Master of the Coombe Lying-In Hospital invited me to take part in the discussion on obstetrical teaching, I gathered that it was proposed that I should state my views as to how medical students should be taught midwifery. To venture to do so in Dublin seemed to me to be an impertinence, more especially when I remember how, in my youth, it had been indelibly impressed upon me that my grandmother was likely to be far more proficient in extracting nourishment from an egg than myself. I therefore asked to be excused from taking part in such a discussion, but to no purpose.

Such being the case, I have approached this subject from a different angle, and will deal with the question "Why has the teaching of midwifery in London, and perhaps in certain other parts of the country, been, in the past, and probably still is, so inefficient?"

You have only to read the Report of the Committee set up by the Section of Obstetrics of the Royal Society of Medicine, 1919 to 1920, to discover what several of the most prominent obstetricians in London thought of this teaching and of the dearth of research work in this branch of medicine. The answer to the question I have propounded is, to my mind, perfectly clear. It is because the medical profession, as such, and the lay public, have in the past failed, are still failing, and, unless they are better educated in this respect, will continue to fail, in the recognition of the following most important and incontrovertible facts.

1. That the present maternal and fœtal mortality and morbidity associated with pregnancy and child-birth will not be appreciably improved until the midwifery service of the country is more complete, and medical students are taught midwifery more efficiently.

2. That, of all branches of medicine, the science of obstetrics has made the least progress and is the most neglected.

* Read at the Centenary Congress of the Coombe Lying-in Hospital, Dublin, Sept. 1926.

3. That in the efficient training and teaching of medical students in midwifery the community, as opposed to the individual, is more directly and personally concerned than in that of any other subject in the medical curriculum. Not only is this so on the score of health, but also for economic reasons.

4. That the only place in which the practice and art of midwifery can be properly taught is in a maternity hospital or in the maternity wards of a general hospital, and that there are not nearly sufficient beds available for this purpose.

Let us take the members of our profession. It is obvious that our medical and surgical colleagues have never realized, until quite recently, the importance of midwifery to the Nation, with the result that they would not agree to the allocation of an adequate number of beds for maternity cases in the hospitals, if indeed any; nor that a sufficient time for training in midwifery should be ear-marked for the students; nor that adequate facilities for teaching, laboratory and research work should be provided. Our colleagues have visualized the vital importance of such things in their own departments and have ensured their provision, but they have remained blind to it in ours, and the obstetricians have had no remedy, being in the minority.

Imagine the reception the senior obstetric surgeon would get, at a meeting of the medical committee of the staff, if he insisted that, for the good of the community, it was essential for the hospital to contain almost as many, if not as many, maternity beds as those apportioned to medical and surgical use, and yet this statement is so nearly true that it is almost axiomatic. Our medical and surgical colleagues have seemed unable to grasp the fact that for the general practitioner a thorough training in midwifery is just as important as, if not more important than, the training they demand as absolutely necessary in medicine and surgery. Is it not a fact, and within the experience of most of those present, that obstetricians have been treated by their colleagues in the past with an amused, if tolerant, want of respect for their calling, and that they have failed to appreciate at their true value the work and ideals of the "man-midwife," as on occasions they are pleased to call him. Even in my time, obstetricians were dubbed "swab and speculum mongers" and their most important operation was declared to be the division of the umbilical cord.

Can it then be wondered at that the minds of successive generations of medical students, with such authorative exposition, have be remembered that a percentage of these medical students were the future consulting physicians and surgeons, and that they

became besotted with the same opinions. Thus it came to pass that the ideas of mdical students with respect to the importance of midwifery to the community were the result of a vicious circle. On the one hand, their minds were receptive of such opinions as I have outlined, and, on the other hand, they were fogged with the idea that midwifery after all, was the least important part of the medical curriculum, since so little attention was paid to it by those in authority, and its teaching was so deficient.

But, after all, as far as the lay boards and medical staffs of hospitals are concerned, the amount of time a student is supposed to devote to any particular subject in the curriculum during his training depends, or should depend, on that which the General Medical Council requires for registration and the various examining bodies stipulate for their degrees or diplomas.

With respect to the two great medical Corporations which are more particularly concerned with the London students:—If one requires any indication of the attitude of the Royal College of Physicians to the teachers of mid-wifery, it is signally exemplified by two outstanding facts. They are, that up to recent years at any rate, a medical man who aspired to a position on the staff of a London hospital as an obstetrician, had to be a Member of the Royal College of Physicians. Now it has always been a custom of the Council of the Royal College of Physicians to promote to its Fellowship those of its Members, in London at any rate, who are elected to the post of assistant physician to a hospital with a teaching school, and that within six or seven years of their being admitted as Members. What happens to those Members who are practising obstetrics? A few of these never obtain the Fellowship, perhaps for very good reasons; the larger number is at last promoted to the Fellowship after being Members for 10, 11, 12, 13 or many more years. Why? No reasonable answer can be given except that midwifery has always been held by the pure physicians as of very small account. The other, perhaps the most important Committee of the Royal Colleges of Physicians and Surgeons from the point of view I am discussing, is the Joint Board of Management, and yet it will scarsely be believed that, although midwifery and gynæcology form one third of the final examination, there has never, as far as I know to the contrary, been an obstetrician elected to this Board of Management.

As a further indication, although it is ancient history, but after all midwifery is an ancient art, Clause 10 of the Charter of 1843 of the Royal College of Surgeons provided that no Fellow of this College who practised midwifery should be eligible as a Member of the Council, which rule remained in force until 1852, when it was abolished by a Charter granted that year. Nevertheless, I

believe that I am correct in saying that it was not until the year of our Lord 1926 that an obstetric surgeon was elected to the Council in the person of Mr. Bonney. This, of course, has nothing to do with the College as such, but it is an indication of the importance placed by the Fellows on the teaching and practice of midwifery.

Being of a curious turn of mind, I thought I would endeavour to ascertain what the General Medical Council had done for midwifery, since its foundation in 1858. A perusal of the minutes of the Council will disclose the fact that, from time to time, spasmodic efforts were made by a few of its more enlightened members to improve the education in midwifery, but they were rarely successful, and it is an outstanding fact that no regulations were formulated for the education of the student in midwifery until an obstetrician had at last secured a seat on the Council.

It was not until 1869, eleven years after the General Medical Council was founded, that midwifery was included as a compulsory subject in the curriculum for medical students. The Council at this time certainly remarked that in the regulations of some of the licensing bodies the space allotted to midwifery was too small, and further thought that the instruction in practical midwifery should be extended, but it made no official recommendation thereto. In 1871 a member of the Council brought forward a resolution that the course of midwifery should be extended, and should include the attendance on 20 cases of labour. The majority of the physicians and surgeons came down on this proposition like a sledge-hammer, and it was squashed, vain attempts having been made to save the situation by amendments to reduce the 20 to 10.

Eight years later, in 1879, the Obstetrical Society of London woke up and "respectfully begged" the General Medical Council to approve of no scheme of medical education that did not provide for a six months' course in midwifery. The General Medical Council referred this petition to the various licensing bodies for their opinion, with the result that, as far as London was concerned, they were hostile to the proposal, although the Royal College of Physicians did suggest that perhaps a little more practical instruction might not be amiss. Acting on this hint some members of the General Medical Council tried to get a recommendation passed that a student must attend 20 courses of labour, but although in the course of the debate this number was whittled down to 6, in a desperate attempt to get something done, the proposal was negatived.

In 1888, the Council for the first time laid down definite regulations for the training of medical students in midwifery, namely, three months' indoor practice in a lying-in hospital, or the presence at not less than 12 labours, 3 of which the student had to conduct

personally under the direct supervision of a registered medical practitioner.

Seven years later, in 1895, the General Medical Council became suspicious that its recommendation of 1888 was not being complied with, and the result of an inquiry proved conclusively that this was so. In spite of the information that it obtained to the contrary, the Council came to the curious conclusion that the education in midwifery was satisfactory, because no examiner had reported any deficiency, nor had any representation been made by an outside body. Its conscience, however, seems to have been pricked, since it was careful to announce that the phrase "direct supervision" meant "conducted in the presence of."

In 1896, the Council passed a recommendation that the alternative to three months' practice in a lying-in hospital should be that a student must be present at not less than 20 labours, 5 of which should be conducted throughout under the direct supervision of a registered medical practitioner. Up till 1896, therefore, seeing that the number of beds in the lying-in hospitals was far too few, and, moreover, that the fees for attending such hospitals were an additional expense to the parents of the students, the vast majority of students did their cases in the "extern" department of their own hospitals. The only preparation a student had for such an experience was acquired from a text-book and attending at lectures, if he thought fit to read the one or attend the other. I take it that to learn the practical essentials of any subject in the medical curriculum from such sources as I have indicated is most difficult, if not impossible, and I imagine midwifery can be no exception to this rule.

The recommendation that the first 5 labours should be conducted throughout under direct personal supervision was never complied with. The custom, at most hospitals, at any rate, was for the obstetric house officer to accompany the student to his first two or three cases of labour. This he did if his other duties in the hospital did not claim his attention; but a student often had to attend his first case under the *ægis* of a fellow-student, who might have two cases to his credit, or, on occasions, even alone.

Nine years later, in 1905, Dr. John Williams, having apparently realized from the Registrar-General's report that the maternal mortality had not fallen during the past fifty years or more, instigated the General Medical Council to set up a Committee, of which he was appointed Chairman, to report on the teaching of midwifery to medical students. This Committee reported that the recommendations of the Council relative to the training of students in midwifery *had not been complied with, and that there was no evidence to show that those who had passed the examination*

possessed the required knowledge and skill for the practice of midwifery. The Council, therefore, in 1907, made alternative recommendations to those of 1896. As far as the General Medical Council was concerned, this was a great advance, but the regulations were entirely ignored by the majority of the teaching schools and examining bodies. In 1919, twelve years later, the Council once more became suspicious that its recommendations were not being carried out, and, at the instigation of Sir Francis Champneys, the various teaching bodies were again requested to report how far they had complied with the recommendations of 1907. The replies were most equivocal, varying from "that these had been embodied in principle" to "they had not been complied with for want of material." The General Medical Council thereupon passed the present recommendations, which came into force in 1923.

I thought, therefore, it would be of interest to ascertain how far the Council's latest recommendations are now being complied with, and by the courtesy of the obstetrical staffs of the twelve teaching hospitals for London I am able to give you the figures for 1925.

Number of Students attending cases at their own hospital -	597
Number of maternity in-patients at the 12 hospitals -	3719
„ district cases at the 12 hospitals - - -	6128
Average number of cases attended by each student - -	16.4
„ „ in-patients „ „ „ „ - -	6.2
„ „ district cases „ „ „ „ - -	10.2
Largest average number of cases attended at any hospital -	27.1
„ „ „ in-patients „ „ „ -	14.6
„ „ „ district cases „ „ „ -	26.8
Smallest average number of cases attended at any hospital -	8.9
„ „ „ in-patients „ „ „ -	0.3
„ „ „ district cases „ „ „ -	0-5
Number of hospitals in which the students had over 20 cases	10
„ „ „ „ „ 15 „	6
„ „ „ „ „ 5 in-patients	6

In order to comply with the recommendations of the General Medical Council there should have been a total of 11,940 cases. There were, in fact, 9,847, *i.e.* 2,093 too few. In addition, 116 students took their practical course at maternity hospitals where they were given an average of 4 cases each and looked on at the pupil midwives delivering patients for the remainder of their time. These 116 students, therefore, on an average were 16 short of the number required by the General Medical Council, as regards personal delivery. It is obvious, therefore, that the General Medical Council's recommendations that a student should attend 20 cases

are far from being complied with. During 1925 the pupil midwives nursing the maternity wards had apportioned to them 979 in-patients and 1,481 district patients, making 2,460 in all.

I certainly had the impression, before I went into the matter, that the General Medical Council was the chief villain of the piece, because, although it had on three occasions during the last 68 years made recommendations relative to the education of medical students in midwifery, it had not insisted on these being complied with, which meant and means that they were not and are not complied with. It is to be noted, however, that the General Medical Council is not master of the situation. Section 20 of the Medical Act ordains that any defects in the course of study or examination of the student may be represented by the General Medical Council to the Privy Council; and Section 21, that the Privy Council may suspend the right of registration in respect of qualifications granted by any licensing body. I am unable to say whether the General Medical Council, finding that its recommendations had been so frequently ignored during all these years, ever made representation to the Privy Council. I suspect not, because of the inherent difficulties of the medical schools complying with its recommendations, or, if it did, probably the Privy Council, as a matter of public policy, refused to act.

It must also be remembered that the General Medical Council does not elect its own members, but that these are appointed by some 30 different bodies. It is a striking fact, however, that during the 68 years that the General Medical Council has been in existence some 182 physicians, surgeons and general practitioners have been appointed to the Council, but only 4 obstetricians; and that for a total of 38 years there was no obstetrician on that body which governs the curriculum of the medical student, the first one being appointed 28 years after its foundation, at the instigation, I believe, of the Obstetrical Society of London. There is no obstetrician on the Council now. Such facts are an indication of the position the teaching of midwifery held, and holds, in the estimation of the various bodies which select members of the medical profession to represent them on the General Medical Council. There appears to be no doubt of the value to the community of having at least one obstetrician on the General Medical Council when it is remembered that on the only three occasions when recommendations were made to improve the teaching of midwifery these were due to the activity of the obstetricians who have been on the Council, Sir Matthews Duncan, Sir John Williams, and Sir Francis Champneys.

Can it then be wondered at that the public, which includes the governing bodies of the hospitals—and in the end it is the public

that counts—taking its cue from the sources I have already enumerated, have regarded the practice of midwifery and its teaching as the least important part of the medical curriculum, and as a subject of but little consequence? But the public is waking up. It wants to know why there has been no improvement worth mentioning for the last 70 years in the mortality and morbidity of pregnant, parturient and puerperal women, and in the child-mortality during its first month of separate existence. The answer is most simple. There are not sufficient maternity beds for the efficient teaching of midwifery, and for the safe protection of the mothers of our citizens, The public must be impressed with the truth of that which Dr. Fairbairn has so often and so ably stressed: that in the efficient practice of midwifery is to be found the greatest example of preventive medicine in the medical curriculum.

The most valuable thing in life is health. The most valuable assets to a nation are healthy citizens. It is surely not Utopian to believe that if such ideas could be brought home to our millionaires, some of them, at any rate, instead of giving £50,000 for a picture or a race-horse, or a quarter of a million for an estate, might wonder whether better use, perhaps, could not be made of their superfluous cash in providing additional maternity beds for the care of the working women of their country and for the efficient teaching of the prospective medical attendants of their womenkind.

The Material and Methods of a Gynæcological and Obstetrical Clinic*

By W. Blair Bell, B.S., M.D. (Lond.)

Professor of Gynæcology and Obstetrics, the University; Gynæcological and Obstetrical Surgeon, the Royal Infirmary, Liverpool; Hon. Fellow American College of Surgeons; Hon. Fellow American Gynæcological Society, etc.

The Material and Methods of the Gynæcological and Obstetrical Department of the Royal Infirmary, Liverpool.

A.—Material

In preceding communications I have described the Material and Methods of the Department of Gynæcology and Obstetrics in the University of Liverpool. The material appertaining to the Hospital (Royal Infirmary) Clinic, which I shall now consider, consists of the buildings and of the arrangements for the reception of patients (human material). In a subsequent paper I shall discuss the methods of teaching, and this will include a description of the manner in which the records are kept, and the general principles adopted in regard to surgical procedures, short of the details of actual operative technique.

In connexion with the department of Gynæcology and Obstetrics in the Royal Infirmary, the accommodation is as follows:—

Building Accommodation

1. Suite of rooms in the out-patient department of the Hospital for antenatal, postnatal and infant clinics, and for gynæcological out-patients.
2. Maternity wards containing approximately twenty beds.
3. Labour theatre in connexion with the maternal wards.
4. Labour room for women in the first stage of labour, adjoining and opening into the labour theatre.
5. Bathroom for babies, adjoining and opening into the labour theatre.
6. Gynæcological wards containing approximately twenty beds
7. Operation-theatres.

*Continued from p. 45 of Vol. XXXIII, 1926.

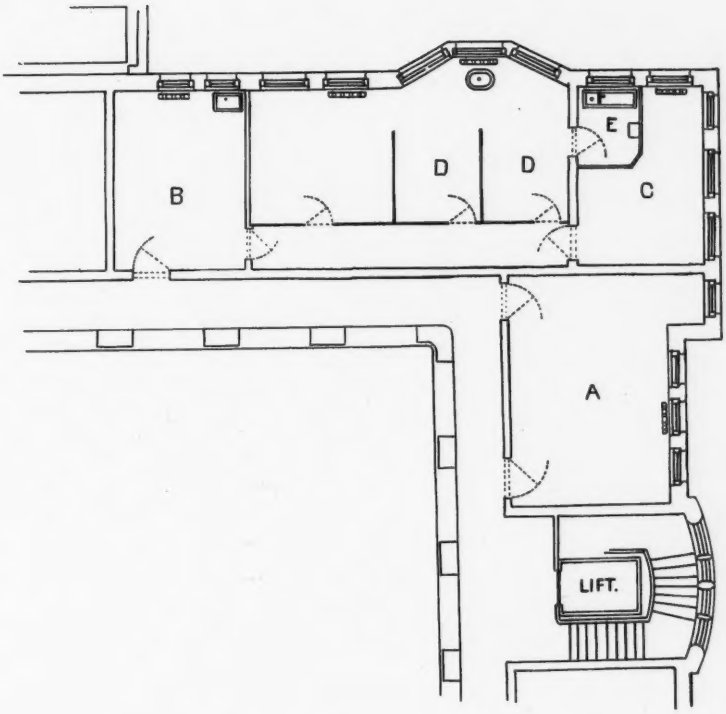


Fig. 14.

Plan of the Gynæcological and Obstetrical out-patient department at the Liverpool Royal Infirmary.

A : Waiting-room. B : Consulting-room. C : Dressing-room. D : Cubicles in Examination room. E : Sterilizing-room. Room A measures 18 feet in length and 13 feet in breadth.

UNIV. OF MICH.

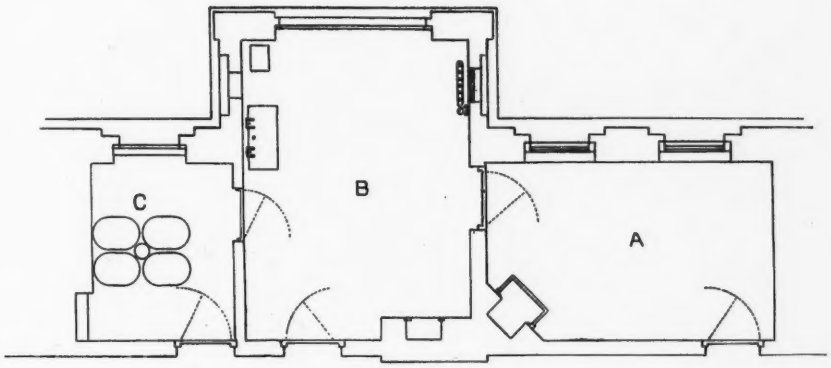


Fig. 15.

Plan of the Labour Theatre Suite at the Liverpool Royal Infirmary. A : First stage labour room. B : Labour Theatre. C : Bathroom for babies.

The Labour Theatre (B) measures 17 feet in length and 13 feet in breadth.

UNIV
OF
MICH

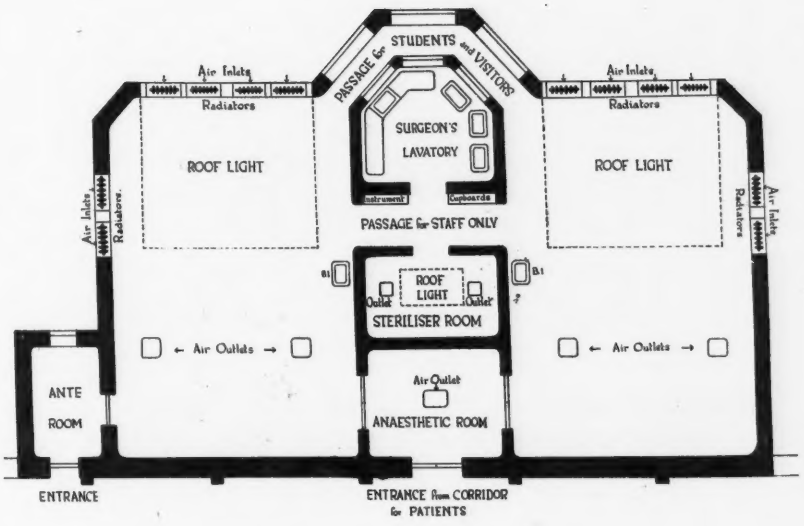


Fig. 16.

Plan of the Gynæcological and Obsetrical Theatres at the Liverpool Royal Infirmary. Each theatre measures 30 feet in length and 21 feet in breadth.

UNIV. OF MICH.

Fig. 17.

Corner of one of the Gynæcological and Obstetrical operation theatres at the Liverpool Royal Infirmary, showing doors leading to anæsthetizing-rooms.

UNIV. OF MICH.

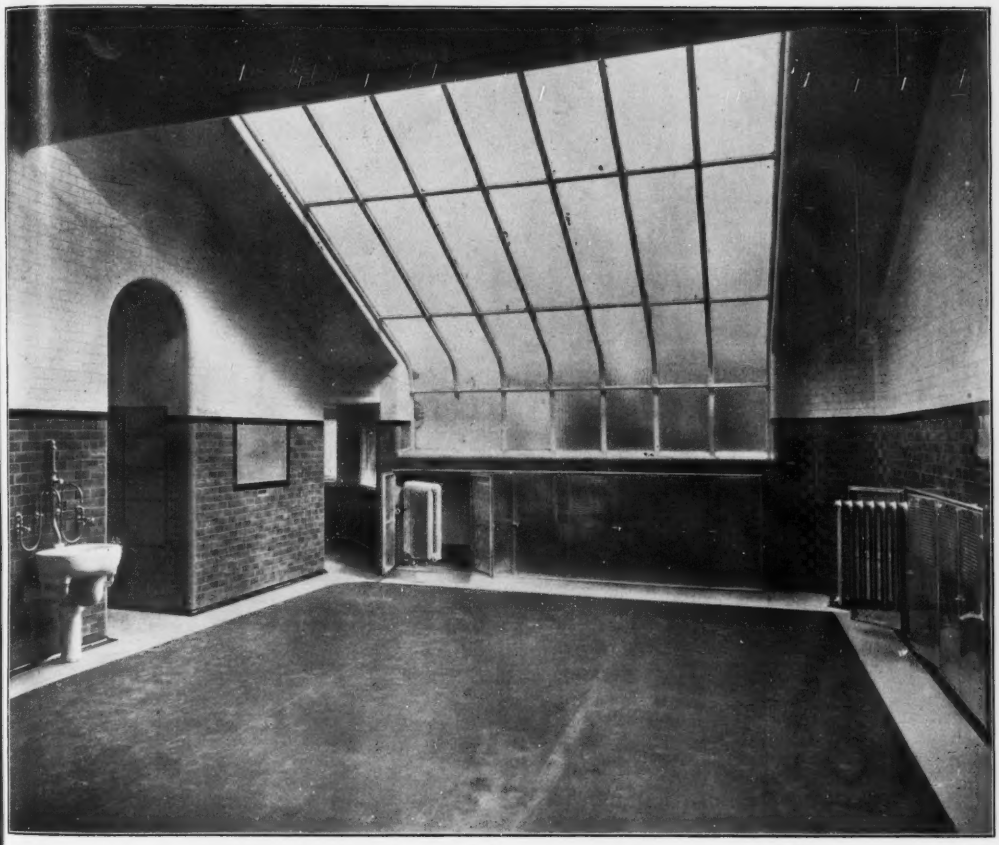


Fig. 18.

North end of the second Gynæcological and Obstetrical Operation Theatre at the Liverpool Royal Infirmary, showing the passages for the staff and for the onlookers leading to the first theatre, radiators, and other features.

UNIV. OF MICH.

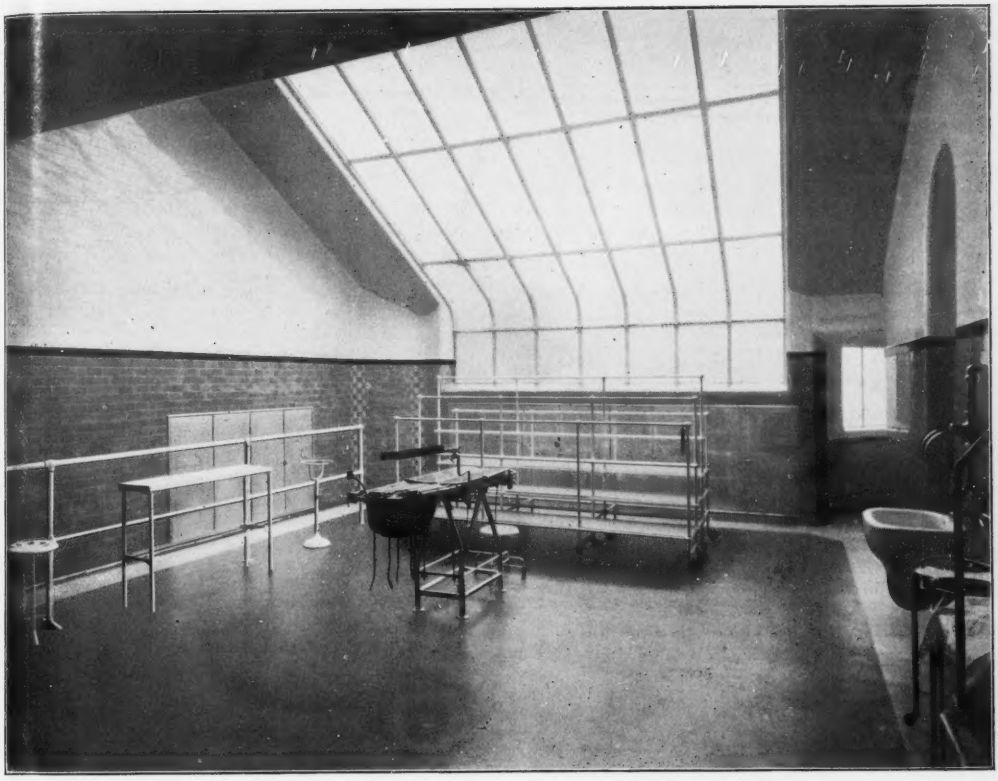


Fig. 19.

North end of the first Gynæcological and Obstetrical Operation Theatre at the Liverpool Royal Infirmary, showing rail on the left, operating-table, the onlookers' stand and other features.

UNIV. OF MICH.

It must not be forgotten that in the case of the Royal Infirmary, as in the case of the University Department, gradual and great developments in regard to gynæcology and obstetrics have taken place during the last few years, and that these changes and extensions have necessarily been limited by, and adapted to, the space available. It is not to be doubted that if a new building had been constructed, some of the structural arrangements would have been improved in dimensions and position. Nevertheless, the outcome of our endeavours has been the establishment and equipment of a most satisfactory department.

With regard to the wards, I need say nothing beyond the fact that there are two main wards, one for gynæcological and the other for maternity cases, a small ward for gynæcological cases, a room for the examination of maternity patients, and three separate rooms—including the labour room—to accommodate four maternity patients. There are also, a waiting-room por patients and their friends, a clinical room and the usual lavatory and kitchen arrangements. It may be mentioned, as a point of importance, that the large maternity and small gynæcological wards have open air balconies on which beds can be placed. Septic cases can thus be treated entirely in the fresh air.

The out-patient suite

This suite (Fig. 14), which, like the other buildings, is exclusively devoted to the work of the department of gynæcology and obstetrics, is situated in the new out-patient department of the Hospital. Patients are admitted and obtain their cards in the manner common to the other out-patients of the Hospital. The ordinary medical and surgical patients collect and wait in the central hall, but for the gynæcological and obstetrical patients there is a separate waiting-room in connection with the gynæcological and obstetrical consulting rooms on the first floor, to which there is a lift.

The disposition of these rooms is shown in figure 14. The new patients are taken from the waiting-room (A) to the consulting-room (B) by a nurse. The history is taken by one of the dressers, and afterwards the patient is taken to the dressing-room (C), where she completely disrobes and puts on the washable dressing-gown provided. Next, she is taken to one of the examination cubicles (D.D.) where the assistant surgeon, seeing the cases on that day, makes a complete examination and allows two dressers to do the same.

The instruments used for the purpose are sterilized in an adjoining room (E), which abuts on the patients' dressing-room. There

is a window between the two, through which the nurse can keep an eye on, and speak to, the patients in the dressing-room, should this be necessary.

In the main examination room there is, in the bow of the window, at the open ends of the cubicles, a fountain basin. There are a desk and blackboard for teaching purposes, in an open space at the end of this large room, and a folding partition is provided in order that three or four cubicles can be arranged, if found necessary. Two cubicles (D. and D.) are permanent fixtures.

After the patient has been examined, she goes back to the dressing-room to put on her clothes. She is then taken by the nurse to the consulting-room (B) where instructions are given to her if she is to be admitted to the wards, or treatment is prescribed.

All the case card are stored in filing-cabinets in the consulting-room (B). The cards themselves will be described in the next instalment, but it is appropriate here to indicate how they are manipulated when in use.

If a case seen in the O.P. department is to enter hospital for operation, confinement, or further investigation, the case card is immediately sent to the ward to which she is to be admitted, and there filed until she enters. Further notes are made on her card while she is an in-patient. When she leaves the hospital, the patient is given a small card on which is entered the first date on which she is subsequently to report in the O.P. rooms for her after-history to be recorded. This date is altered on each occasion that she presents herself to a future date, until it is considered unnecessary for the patient to continue attendance. On the departure of the patient from the ward, her case card is returned to the O.P. consulting-room to be filed and to be kept up to date in regard to the subsequent history of the case.

Labour theatre suite

The arrangements of this suite are quite recent.

The *labour room* (Fig. 15A) abuts on the main corridor leading to the maternity wards, and is adjacent to the labour theatre into which it opens.

In the labour room is accommodation for two beds. These are special beds on which labour is conducted, and which can easily be wheeled into the labour theatre, where the actual confinement takes place.

This room is never occupied except by women in the first stage of labour—women who have previously been bathed and clad in clean attire in which they are confined.

The labour theatre (Fig. 15B) in which women are delivered is modelled on the plan of a modern operation theatre of small

size. There is a large window light, in which there are no apertures, a small window at the side being used for ventilation. An extracting-fan is placed in the wall of the window bay opposite to the small window.

The instrument cupboard is sunk flush with the wall. There are an instrument sterilizer and a washing-sink, over which there is a supply of sterile water. It is inadvisable to have a labour theatre opening directly into the main ward for reasons so obvious as to need no description.

Bathroom for babies (Fig. 15C). This adjoins the labour theatre on the side opposite to that connected with the labour room. There are four babies' baths incorporated in one unit.

Operation Theatres

These theatres, which were built to the design of the writer, have now been in use for three years. We have had time, therefore, to find out whether any improvement could be made if they were to be built again to-day. I think it is correct to say that no alteration of value or importance has suggested itself, apart from the correction or elimination of some of the faults perpetrated by the builders and those responsible for the erection of the theatres: gun-metal should have taken the place of iron in the window frames; an unnecessary number of radiators has been supplied; the coves did not meet the floor, the angular space left had to be fitted with specially prepared rubber strips, and so on.

The principal features are:—

General plan. This is shown in figure 16. It will be noticed that the two theatres are served by one anæsthetizing room, which opens on to a main corridor and into each theatre (Fig. 17), and by one sterilizing-room and washing-up room, which open one on either side of a connecting passage (for the use of the staff) between the two theatres (Fig. 18). In the walls of this passage are recessed instrument cupboards.

Students and visitors pass from one theatre to the other by way of a passage that runs round the bay made by the windows of the washing-up room (Fig. 18). The washing and gowning of the staff is thus open to inspection through the windows.

Apart from the entrance to the anæsthetizing-room, through which patients alone are admitted, there is only one portal. This leads from the main corridor to the robing-room for students and visitors; from this, admission to the first theatre is obtained. A rail, however, prevents anyone from crossing the theatre; he must go to the end where the visitors' stand is placed (Fig. 19).

Walls: These are covered with tiles, bluish in colour below, and white above.

In each theatre there is an aphorism in bluish lettering burnt on to a series of specially-prepared tiles. In the first theatre the maxim reads as follows:—

> "He who is trained only in theory and is not experienced in practice, knows not what he should do when actually dealing with a patient. On the other hand, a surgeon who is educated in practice alone and knows nothing of science, will not earn the respect of better men."
>
> Brahman Precept B.C. 200.

In the second theatre the aphorism reads:—

> "The surgeon must be prepared not only to do what is right himself, but also to make the patient, the assistants, accessories and surroundings co-operate with him."
>
> Hippocrates. B.C. 450

Such statements impress the student. He realises how much thought has been bestowed on surgery through the centuries. He acquires from them a certain idealism, which, it is to be hoped, colours his outlook on medicine.

In each theatre there is a slate for demonstration purposes, sunk flush with the walls, and one for the enumeration of the dabs given out and collected.

Floor: The floor is covered over with ruboleum, a composition material resembling rubber. It has the advantage that it is laid down in strips seven feet in width. There are thus only three strips in these theatres, surrounded by a border eighteen inches in width. The central strips are black, for this is the only colour that does not stain, and the borders are blue. The whole is permanently cemented down to the concrete beneath.

This floor is silent, pleasant in appearance, and clean.

The floors of the theatres, of the washing-up room, and of and sterilizing-room slope towards open gutters. Water taps and hoses are provided in order that they may be flushed.

Lighting: The large window lights, which cover nearly one half of the roof, face north (Figs. 18 and 19). There are no side windows. This arrangement ensures the best possible daylight. At night, a simple, cheap method of electric indirect illumination, which has been used in the theatre of the writer's private hospital for many years, gives a most excellent light (Fig. 17).

Heating and ventilation: Heating, in the winter, is effected by means of steam radiators (Figs. 18 and 19). These are recessed

in the walls and are of the swing-out type; air enters through an aperture below and behind each radiator, and passes through a gauze filter. The recesses in which the radiators are placed are protected by aluminium doors flush with the theatre wall (Fig. 18). Each door is perforated by round holes half an inch in diameter in the upper third; consequently, the air admitted below passes over the radiators before entering the theatre.

A large extracting-fan, placed in an attic above the theatre, draws the air through in a constant stream from the theatres and adjoining rooms. In this way the atmosphere is always maintained fresh and cool.

Fixtures and apparatus in the theatres and adjacent rooms:

Theatres: These are similarly equipped. There is a hopper attached to the wall on the outside of the sterilizing-room. The water, hot and cold, supplied by swan-necks, is sterilized (Figs. 18 and 19). In each there is a spectators' stand, an operating-table, and a stand, which, used in conjunction with a slate embedded in the wall, forms an automatic dab and pack counter. The operation table and the dab-counter will be described inu the next article. At the end of each theatre there is a stand of shelves for boxes, bottles and the rest. There are the ordinary instrument tables, bowl stands, and stools. It is a feature that, with the exception of the double bowl stands, none of the various articles is provided with castors—all must be lifted into position before the operations commence—thus much noise is prevented.

Sterilizing-room: Fitted in this room are a large, high-pressure vacuum sterilizer, two cylinders for the sterilization of water, a large bowl sterilizer and two sterilizers for gloves and instruments. The lids of the sterilizers are opened by pressure on a pedal, and they close quietly, owing to their being connected with oil and air pressure stops.

(To be concluded)

Hæmorrhage from the Non-Gravid Uterus following Trauma.*

By DOUGLAS M. LINDSAY, M.B., Ch.B., (Glasgow). F.R.F.P. & S.

Assistant Visiting Surgeon, Royal Maternity and Womens' Hospital, Glasgow, and Assistant Visiting Surgeon, Royal Samaritan Hospital for Women, Glasgow.

SINCE the introduction of the Workmen's Compensation Act there has arisen a very comprehensive literature on the subject of Compensation Medicine, the contributions of Sir John Collie[1] and Douglas Knocker[2] being noteworthy; while, more recently, the experience of the Ministry of Pensions may be acknowledged as having reduced the Medical and Surgical aspects of Compensation to a sound basis. Unfortunately, however, that branch of compensation medicine dealing with obstetric and gynæcological conditions, has been neglected. How much the National Health Insurance Act, which largely disclaims responsibility for obstetric cases, has aggravated this disregard, is a matter for speculation, but, that it has done so, I am satisfied.

The medical report in obstetric and gynæcological accident cases tends to be an evasive, non-committal document, because of that neglect and since attendance at a court of law entails an enforced, and often protracted absence from one's practice; exposes one to the frequently disconcerting cross-examination of counsel; and seldom offers adequate remuneration: three factors calculated to damp the interest and enthusiasm of most medical men for such cases. This protective medical reticence is reflected in the attitude InsuranceCompanies and Corporations, whose agents would settle, rather than fight, cases introducing such elements. Claimants and their agents have quickly appreciated this trepidation, and realizing that an intimate disablement, more particularly a disablement to an expectant mother, appeals strongly to a sympathetic mixed jury, they very frequently, incorporate such an obstetric or gynæcological complaint in their allegations.

During the past five years I have examined one hundred and thirty four women claiming damages for injury. In eighty-one cases (60 per cent.) the claiment alleged interruption of or possible

* Read before the Glasgow Obstetrical and Gynæcological Society.

future involvement of, a pregnancy, while the complaints of the remaining fifty three patients (40 per cent.), were of a gynæcological nature.

In 25 (47 per cent.) of the gynæcological cases the patients complained of hæmorrhage following the trauma, and it is these—more particularly a sub-group of them—I wish to discuss.

A. *Established Malingering*; 2 cases. In both instances the bleeding was due to normal menstruation.

B. *Physiological bleeding falsely attributed to trauma*; 2 cases. In one patient the bleeding was due to the return of menses after a period of lactation, in the other it was the last of a series of slight menopausal hæmorrhages.

Pathological hæmorrhage falsely attributed to trauma; 3 cases. In these three cases the bleeding was due to:—

1. Long standing fibrosis uteri.
2. Advanced cervical carcinoma.
3. An extensive erosion.

D. *Hæmorrhage following traumatic uterine displacement;* 2. cases. In one case the claimant was suffering from a definite traumatic retroversion of the uterus, in the other there was a questionable traumatic retroversion the woman having been delivered some twelve weeks prior to her accident.

E. *Pathological hæmorrhage following trauma without discoverable lesion*; 16 cases. This group comprises 64 per cent. of the total gynæcological cases associated with hæmorrhage. It consists of examples of uterine hæmorrhage commencing, at varying intervals, after injury, and in which a subsequent bi-manual examination failed to discover the slightest abnormality in the uterus Fallopian tubes and ovaries.

Preferring the physiological, or even the pathological, to the psychological, I am loathe to accept such nebulous explanations as shock, fright, or neurosis in manifestations so real as uterine hæmorrhage, believing that in accord with our present knowledge of genital function some other cause may be found to explain such examples of traumatic metrorrhagia.

While 16 cases are not sufficient to permit of dogmatism, they support my view that these hæmorrhages may result from injury to an ovary, a corpus luteum or a Graafian follicle.

The ovary, despite its apparently well protected site on the posterior surface of the broad ligament, may suffer trauma as the result of externally applied violence. Ovarian hæmatomata may be found in the ovarian stroma, or in an already formed space, such as a corpus luteum or Graafian follicle, as recorded by Munro

Kerr[3] and Frank[4] and I am in agreement with Haig Ferguson[5] that they may be due to such stimuli as a cough, heavy lifting or handling during operation.

Bearing in mind the vascularity of the ovary, the frequent varicosity of the adjacent vessels, the ready occurrence of these ovarian hæmatomata, and the very fragile structure of this organ which are responsible for the cyclic menstrual change, what part does an injury to the ovary play in uterine bleeding following trauma?

Munro Kerr and Haig Ferguson[6] accept the view that the Graafian follicle ruptures some time between the seventh and the fourteenth day prior to the onset of the menstrual period. Schieller[7] believes that, normally, rupture occurs on the eleventh day from the beginning of the menstrual cycle. Frankl[8] is less dogmatic in dates, but very definite on principles, which he expresses thus:—

> "While a corpus luteum persists, no menstruation can occur and no follicles develop. When the corpus luteum degenerates, menstruation commences. When a corpus luteum is removed the flow starts."

He describes two methods by which a corpus luteum may be damaged or destroyed by hæmorrhage; the first, a bleeding into its substance, the second, hæmorrhage into the stroma at its base, leading to its extrusion from the ovarian surface. Cohn,[9] Urban,[10] Luppoff[11] and others describe prolapse, extrusion, and even complete shedding of the yellow body.

The result of such corpus luteum injury or death would be the premature onset of menstruation.

If all cases showed vaginal hæmorrhage within a few days of the application of trauma, the history would be complete, but this is invariably true. In some instances as long as 10 to 15 days elapse before the irregular hæmorrhage appears. Such cases appear to be those in which there is no corpus luteum to injure, but in which its precursor, the Graafian follicle, is maturing.

If a follicle be ruptured prematurely as the result of an injury, the embryo corpus luteum might develop as after a physiological rupture, reach maturity at an earlier date than normal, and produce a premature menstrual flow; it might also, having been the product of a prematurely ruptured, and possibly considerably damaged, follicle, have a shorter active cycle than usual, with an even earlier onset of the period; or lastly, it might not develop at all, in which case the hæmorrhage might be expected very soon after the injury.

Cases Nos. 1 to 7. The interval between the begining of the last menstrual period and the trauma is such as to ensure the presence of a corpus luteum.

Case Number.		Interval in days between last day of period and injury.		Interval in days between injury and hæmorrhage.
1	—	14	—	0
2	—	120	—	0
3	—	14	—	1
4	—	16	—	1
5	—	15	—	2
6	—	22	—	2
7	—	22	—	3

Cases Nos. 8 *to* 14. The interval between the beginning of the last menstrual cycle and the trauma is such as to ensure the absence of a corpus luteum.

Case Number.		Interval in days between last day of period and injury.		Interval in days between injury and hæmorrhage.
8	—	7	—	2
9	—	2	—	2
10	—	3	—	4
11	—	7	—	5
12	—	5	—	10
13	—	1	—	15
14	Period just begun stopped third day.			7 Resumed seventh day.

Case No. 15. The period was due on the day of the injury, but did not appear till seven days later.

Case No. 16. The period had just begun when the accident occurred. Menstruation thereupon ceased and did not return for six weeks. Subsequently the menstrual cycle was altered.

Of the seven cases in the first group in which there was presumably a corpus luteum, there were two in which bleeding began within a few hours of the accident, and two others in which its advent was within the first twenty-four hours. Only one case showed delay until the third day after the trauma. The average interval between trauma and hæmorrhage was 1.28 days.

Cases Nos. 1 to 4, I consider as resulting from complete destruction of the corpus luteum, while Nos. 5 to 7 followed partial destruction with early degeneration.

In cases Nos. 8 to 14 in which there was no corpus luteum at the time of injury, uterine bleeding commenced between 24 and 48 hours after the injury in two cases and in the remaining five there was a greater interval between the injury and the bleeding than in any of the first series. In one case there was an interval of 15 days between the trauma and the onset of the bleeding. In this group the interval averaged 6.43 days.

Cases Nos. 8 and 9 could be explained by complete destruction of the ripening follicle and its embryo corpus luteum; cases Nos. 10, 11, and 14 might represent an effort on the part of the damaged follicle to form a corpus luteum, with very short activity; while cases Nos. 12 and 13 suggest that the follicle had ruptured with little damage to its structure, and that a corpus luteum had developed fully.

Cases 15 and 16 are exceptional. In the first case, a period just due was apparently delayed seven days by injury. I cannot imagine a corpus luteum on the verge of retrogression, taking on a fresh lease of life as the result of injury applied to it, but I can conceive of a follicle rupturing, and, by its attempted lutenisation, delaying the menstrual flow.

The second instance is the most peculiar in the series. I accept the control of the period just begun as an indication of fresh lutein activity, following follicle rupture; but six weeks subsequent amenorrhœa, as also the alteration in cycle, are phenomena which I cannot explain.

It is perhaps noteworthy that, in two of these cases, the irregular bleeding was preceded by sickness, and that one of the patients explained that she was liable to have premature menstruation if, for any cause, she vomited.

The duration of the hæmorrhage in these examples was varying, but, in no instance, was it of greater duration than 10 days, its average for the cases 1 to14 being five and a half days. In three instances there was a slight recurrence a few days after the initial bleeding had subsided.

In most of these cases the single irregular hæmorrhage was the only resulting abnormality, and after the termination of the patient's usual inter-menstrual interval a normal period of her particular type followed. There was no greater disablement attendant on those hæmorrhages than one finds with a normal menstrual period.

1. Collie, Sir John. "Malingering," 1913.
2. Knocker, D. "Accidents in their Medico Legal Aspect."
3. Munro Kerr, J. M. "Clinical Gynæcology." 1922, 491.
4. Frank, T. F. "Obstetrical and Gynæcological Pathology, 1922, 367.
5. Haig Ferguson, J. *Edin. Obstet. Soc.*, see *Centralbl. f. Gynäk.*, 1913, 37, 698, quoted from Frank, T. F. *vide supra*, 367.
6. Munro Kerr, J. M. and Haig Ferguson, J. *Combined Textbook of Obstetrics and Gynæcology*, 1924,50.
7. Schieller. Post Graudate Lectures, Vienna, 1922.
9. Cohn. *Arch. f. Gynäk.*, 1913, 99, 505, quoted from Frank T. F., *vide supra*, 367.
10. Urban, C. *Wein med Wochenschft* 1917, No. 21, quoted from Frank, T. F., *vide supra*, 367.
11. Luppoff, A. *Abst. Centralbl. f. Gynäk.*, 1913, 37, 77, quoted from Frank, T. F., *vide supra*, 379.

Two Cases of Precocious Puberty.*

By GERALD F. KEATINGE M.A., M.D., B.Ch. (Dublin).
Honorary Obstetric Physician, Nightingale Maternity Home, Derby.

Annie W., aged 7, on May 16th, 1920 was admitted to the Gynæcological Department of the Derbyshire Royal Infirmary under Mr. Hicks, to whom I am indebted for permission to publish this case. The parents stated that six months previously she had begun to menstruate, and had continued to do so till the time of admission.

The patient was the youngest child of apparently healthy parents and had three brothers and two sisters, all, so far as was known, normal. The sisters had begun to menstruate at 14 years of age. There was no family history of precocity: the mother began to menstruate at 14 years of age.

The patient was quite normal until November 1919 when she began to menstruate. The period lasted for four days, and returned at regular intervals of 28 days. Shortly before the establishment of menstruation the parents noticed that the breasts began to enlarge and that pubic hair appeared. The child had had measles at three years of age, but with this exception had always been healthy.

On admission the patient was healthy in appearance and about the average height and weight of a child of seven. She was mentally bright and of a cheerful disposition.

On physical examination the child was found to be well developed. The breasts were well formed: pubic hair was present: there was no axillary hair. Examination of the alimentary, respiratory, circulatory, urinary and nervous systems revealed nothing abnormal. On rectal and abdominal examination a cyst of the left ovary of about the size of a tennis ball could be felt. The uterus was of the adult type, not enlarged and in good position. X-ray examination of the skull showed no indications of tumour formation or other abnormality.

Laparotomy was performed by Mr. Hicks assisted by the writer, and the diagnosis confirmed. The cyst of the left ovary was removed, together with the greater part of the left ovary. The

*These patients were shown at the Midland Obstetrical and Gynaecological Society in February 1925.

cyst on examination was found to be a so-called "Dermoid". The right ovary bore scars of Graafian follicles. The child made an uneventful recovery, and was discharged from hospital three weeks after operation.

The girl has not menstruated since the removal of the ovarian cyst. Within six months after leaving hospital the secondary sexual characteristics had completely disappeared. A slight enlargement of the breasts has begun to appear during the last six months. As the child is now 12 years of age, this may be taken to be the beginning of normal puberty.

Margaret P., aged 3½ years, was admitted to the Derbyshire Hospital for Women under the care of Mr. Lochrane in July 1923. The parents stated that the breasts had been enlarged from birth, and that she began to menstruate at one month. The period lasted for seven days, and recurred regularly every 28 days up to the age of six months when she was treated as an out-patient at the Derbyshire Hospital for Sick Children under the care of Dr. E. P. L. Hughes. Treatment consisted in the administration of "Hormotone". The menses then disappeared for six months, without, however, any subsidence of the enlarged breasts. At the end of this time menstruation became re-established as before, in spite of a further six months' glandular therapy. Pubic hair was present by the end of the first year.

The patient was the third child of apparently healthy parents, and had two sisters, 3 and 8 years respectively older than herself, and as far as was known, normal. The elder of the two had just begun to menstruate, the periods lasting for four days and recurring every 28 days. There was no family history of precocity. The mother had amenorrhœa until after marriage at the age of 18, when menses became established, recurring every 28 days, and lasting for four days.

The child had always been big for her age. She walked at 12 months. She suffered from frequent attacks of bronchitis but had had no other illness.

On admission the patient was a stout child, somewhat pale in complexion and noticeably big for her age. Mentally, she was bright, but rather sulky.

On physical examination the child was found to be well developed, with a considerable but not undue amount of subcutaneous fat. The breasts were well formed, and pubic hair was present: there was no axillary hair. Examination of the alimentary, respiratory, urinary and nervous systems revealed nothing abnormal. Circulation was poor, the hands and feet being cold, and in cold weather, cyanosed. The heart sounds were normal.

On abdominal and rectal examination, under an anæsthetic, a small ovarian cyst of the size of a hazel-nut was discovered on the right side. The uterus was of the infantile type and normal in size and shape. X-ray examination of the skull showed no indication of tumour formation or other abnormalities.

Laparotomy was performed by Mr. Lochrane, assisted by the writer, and the diagnosis confirmed. The ovarian cyst was removed with a considerable part of the ovary. Both ovaries bore scars marking the site of rupture of Graafian follicles. No other abnormality was detected, except the presence of a number of hard nodules scattered over the peritoneum and varying in size from that of a pin-head to that of an orange-pip.

The pathological report is as follows :—

(1). The ovary resembles that of an adult, with many Graafian follicles in different stages of development. A number of follicular cysts are seen and there are some old corpora lutea. The large blood cyst is enclosed by granulation tissue. No trace of any living epithelium is seen. I would suggest that it is the result of hæmorrhage into a follicular cyst, or into a corpus luteum.

(2). The gland substance is somewhat œdematous, and the lymph sinuses are dilated.

The patient made an uneventful recovery and was discharged from hospital fourteen days after operation.

The child has not shown any improvement since the operation. Menstruation takes place regularly as before : the secondary sexual characteristics remain. The child is still very big for her age. The measurements are placed for comparison beside those of her sister three years older :—

	Patient	*Sister*
Weight.	5st. 10lbs. 6oz.	4st. 7lbs.
Height.	4ft. 4ins.	4ft. 2ins.
Circumference of Chest.	29 ins.	25ins.

COMMENTS.

1. True precocious puberty in the female, as distinguished from the development of male secondary sex characters, due to tumours of the suprarenal cortex—the so-called suprarenal virilism of Glynn,[1]—is stated to be caused by tumour or hyperplasia of the ovaries.[2]

2. Tumour of the ovary does not appear to be a very usual cause of this condition. Thus, Reuben and Manning,[3] in a survey of the literature found only 23 cases associated with tumour out of a total of 211 cases, while R. Williams,[4] writing in 1902,

collected 70 cases of which 12 were associated with intra-abdominal tumour, but only five with ovarian tumour.

3. In cases associated with tumour of the ovary, operation is obviously indicated, and would seem to be followed by amelioration of symptoms as in the case of Annie W. above and in the case reported by Lucas.[5]

4. In cases unassociated with tumour it seems probable that some other gland of internal secretion is at fault. Thus in the case of Margaret P. above no improvement followed partial oöphorectomy.

5. There does not seem to be any proof available showing that hyperplasia, *per se*, is a cause of precocious puberty.

LITERATURE.

1. Glynn. *Quart. Journ. Med.*, 1912, 127. *Journ. Obstet. & Gynæcol. Brit. Emp.*, 1921, xxviii, 23.
Hutchison and Wauchope. *Brit. Journ. Children's Diseases*, 1924, xxi, 61.
2. Blair Bell. *Proc. Roy. Soc. Med.*, 1913.
3. Reuben and Manning. *Arch. Ped. New York*, 1922, xvix, 769.
4. Williams. *Brit. Gynæcol. Journ.*, 1902, xviii, 85.
5. Lucas. *Transactions of the Clinical Society of London*, 1888, xxi, 224.

Endometrial Tumour of Laparotomy Scar.

By Comyns Berkeley, M.C., M.D. (Cantab.), F.R.C.P. (London).
Senior Gynæcological Surgeon, The Middlesex Hospital

A. D., age 30. In 1920 her first child was delivered by Cæsarean section, her pelvis being "flattened." About three years later, in 1923, a small lump appeared at the lower end of the abdominal scar. The tumour gradualy increasel in size and it was always painful especially when the patient was menstruating. There has been no alteration in the rhythm or quantity of the menstruation.

In 1925 when the patient came under observation, the tumour was circular in outline, one inch in diameter, freely movable on the deep fascia and tender to the touch, while the skin over it was adherent and pigmented.

The tumour was excised, it did not appear to be reaching down to the peritonium, which was not opened, neither was the uterus, Fallopian tube or ovary adherent to the peritonium covering its site.

Microscopic appearance :

Diamond shaped piece of skin 1 inch across. There is a raised puckered scar on the skin beneath which is a firm tumour, white in colour with small petechial hæmorrhages.

Microscopic appearance :

In the subcutaneous tissue there are numerous scattered masses composed of a loose but markedly cellular connective tissue in which lie many tubules lined by columnar epithelium The appearance of the stroma and glandular elements resembles closely that of the endometrium. Many tubules are slightly distended and filled with blood and a few areas of extravasated blood can be seen in the stroma.

A Case in which Endometrial Tissue was accidently Implanted.

By Victor Bonney, M.S., M.D (London), F.R.C.S. (Eng.).

Gynæcological Surgeon, The Middlesex Hospital.

In 1924, I operated upon a young married woman aged 29, suffering from persistent menorrhagia, for which she had already been twice curetted. The abdomen was opened by a transverse skin incision in the pubic hair area, and a vertical one through the fascia, muscles and peritoneum. The uterus was somewhat undersized. I opened its cavity through an incision in its anterior wall, in the hope of finding a polypus or small fibroid. Nothing, however, beyond a thickened endometrium was found and this was curetted away with the blunt end of a scalpel. The wound in the uterine wall was closed, the round ligaments shortened and the abdominal incision sewn up.

At the beginning of this year, the patient was again sent to me, because, although the loss at the periods was much better, she had not conceived. It appeared that within a year of the last operation, a swelling had developed under the skin of the mons veneris, just below the line of the abdominal incision,and the patient stated that it temporarily increased in size and became painful with every monthly period. This swelling was about the size of half a walnut, and smooth and round, and I took it to be a "desmoid tumour" of the aponeurosis.

The patient being anæsthetized, the patency of the Fallopian tubes was tested by inflation and both found to be impervious. I excised the tumour through the original incision, turning the skin downwards to do so. The tumour was situated superficially though adherent to the aponeurosis. On opening the abdominal cavity the uterus was found to be in excellent position, there were no adhesions, and only a trace of the cut made in it two years previously. Both Fallopian tubes appeared abnormally small, though otherwise healthy, but practically the whole of their isthmic segments were impervious.

Report on Specimen by Mr. Fletcher—Eastes Laboratory

The tumour when incised presented a number of small spaces containing chocolate-coloured fluid, lying in the midst of a fibrous matrix. Sections of the tumour present the appearance typical of an endometrioma with well developed islands of stroma containing

well formed uterine glands. These islands contain blood, both in the stroma and in the lumen of the glands. It is my usual practice, when performing an abdominal section, to cover the edges of the wound with sheet rubber. I did not at the first operation use sheet rubber, because the incision in the abdominal wall was very small and the space was cramped, and it is practically certain that a fragment of curetted endometrium was then accidently implanted in the abdominal wound. Since receiving this lesson, I have been very careful to cover the wound edge entirely when performing hysterotomy.

A further point arises, namely, the possibility that many of the so-called post-operative "desmoid" tumours of the abdominal wall, which have been described in the past, were really endometrioma, due to accidental implantation. Speaking offhand, my impression is that nearly all "desmoid" tumours have occurred in women, and usually after operations on the uterus or appendages.

Celluloid Jars for Mounting Permanent Specimens.

By Dorothy H. Douglas, L.R.C.P.I., L.R.S.C.I., and L.M.

Clinical Research Student, Coombe Lying-In Hospital, Dublin.

Following the method* of Professor W. D. O'Kelly, of the National University, Dublin, I have for the past two years been making specimen jars for the Coombe Lying-In Hospital Museum from sheet celluloid (Xylonite). Nowadays, thin glass specimen jars being so very expensive, and, moreover, difficult to obtain within any reasonable time, celluloid jars have very great advantages, in that they are cheap and can be made in the laboratory to any shape or size desired.

For small specimens thin celluloid is used and for heavy specimens thick celluloid.

Method of making small rectangular jars for light specimens.

For a jar X ins. long, by Y ins. broad and Z ins. high, cut a strip of celluloid Z ins. across, 2X ins. plus 2Y ins. plus $\frac{1}{2}$ inch in length, the extra half inch being for overlapping at the join, which is best made at a corner.

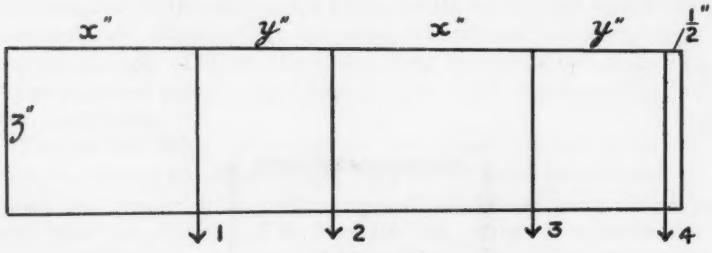


Fig. 1.

The method of bending the celluloid at right angles is as follows: Fig. 1. A rectangular metal bar is warmed evenly till it is as hot as the hand can hold, and it is then laid on the celluloid strip and the latter is bent at right angles round the bar in the position of the arrows 1. 2. 3. 4. The rectangular sides having

* Published in The Journal of Pathology and Bacteriology Vol. XXVII. 1926. pp. 116-118.

thus been formed amyl acetate is applied with a camel hair brush to the overlapping surfaces which are then held together for a few minutes until they adhere. Before applying the base and the lid, the top and bottom edges are reinforced with narrow strips of celluloid, about $\frac{1}{4}$ inch wide, as in Fig. 2. These extra pieces help to preserve the rectangular shape of the jar and give a broader surface to which the base and lid can be applied.

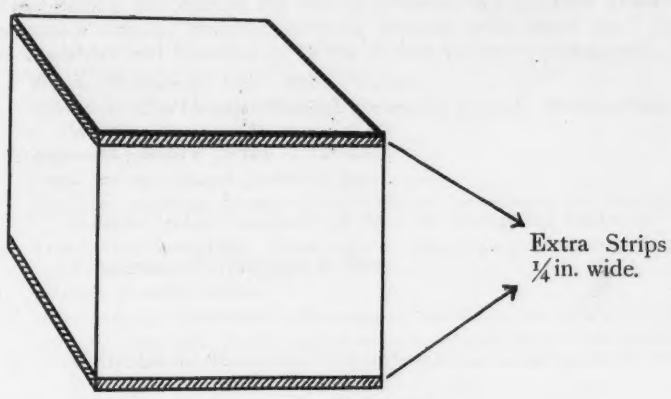


FIG. 2.

Pieces of celluloid are cut to form the lid and base of the jar, and are secured in position with amyl acetate.

METHOD OF MAKING LARGE RECTANGULAR JARS FOR HEAVY SPECIMENS.

Thick celluloid is used, being cut with a sharp knife to the exact measurement of each side of the jar. The sides are arranged at right angles, as in Fig. 3, which are then stuck together with amyl acetate.

FIG. 3.

The base and lid are cut and applied in the manner already described. If thick celluliod is used reinforcement with the extra strips is not necessary. Some of the specimens in the Coombe Lying-In Hospital Museum together with the fluid medium, weigh

20 pounds, and the jars hold this weight without giving way or bulging. In a similar way, oval, cylindrical or any other shaped jars can be made.

The thick celluloid is sold in sheets, 54 inches by 24 inches, and is of the variety known in the trade as 50/1000 thick. In Dublin, owing to the excise duty, it costs £1-15-0 a sheet, but should be much cheaper in England. The thin celluloid costs 1/6 per square foot.

Review of Current Literature.

DIRECTOR: FRANK E. TAYLOR,
M.D., B.S. (Lond.), F.R.C.S. (Eng.), M.R.C.P. (Lond.), D.P.H. (Cantab.)

THIS Review will contain the lists of contents, and abstracts of the more important articles, from the following journals, with which the "Journal of Obstetrics and Gynæcology of the British Empire" exchanges:—

British.—The Lancet; British Medical Journal.

Canadian.—The Canadian Medical Association Journal; Bulletin Medical de Quebec.

Australian.—Medical Journal of Australia.

South African.—Medical Journal of South Africa.

American.—American Journal of Obstetrics and Gynæcology; The Journal of the American Medical Association; Surgery, Gynæcology and Obstetrics.

French.—La Gynécologie; Gynécologie et Obstétrique; Bulletin de la Société d'Obstétrique et Gynécologie de Paris.

Belgian.—Bruxelles-Médical.

Italian.—Annali di Ostetricia e Ginecologia; Archivio di Ostetricia e Ginecologia.

German.—Zeitschrift für Geburtshülfe und Gynäkologie; Archiv für Gynäkologie; Zentralblatt für Gynäkologie; Monatsschrift für Geburtshülfe und Gynäkologie; Münchener Medizinische Wochenschrift.

Scandinavian.—Acta Gynecologica Scandinavica.

South American.—Boletin de la Sociedad de Obstetricia y Ginecologia de Buenos Aires.

It is hoped that the Review of Current Literature will keep the readers of this Journal in touch with current work throughout the world. At the end of each year it is proposed to print an Index of all the subjects contained in the articles of the above journals. Arrangements will also be made to include abstracts of important articles on border-line subjects, such as Physiology, Biology and Biochemistry.

LIST OF ABSTRACTORS.

London: J. LYLE CAMERON, F.R.C.S., DOROTHY N.L. LEVERKUS, M.B., F. E. TAYLOR, F.R.C.S., JUSTINA WILSON, M.R.C.P.
Leeds: A. GOUGH, F.R.C.S.
Rugby: ROBERT A. HENDRY, F.R.C.S.
Sheffield: W. W. KING, F.R.C.S.
Glasgow: JANE H. FILSHILL, JAMES HENDRY, M.D.
Sydney: T. FARRANRIDGE, M.B.
Huddersfield: W. E. CROWTHER, M.B.

British Medical Journal.

June 5th, 1926

*Hæmatoma in the abdominal wall simulating pelvic new growth. W. E. Fothergill.

Rectal anæsthesia. R. B. Coleman.

*Twisted ovarian pedicle in a child. J. Morris.

Gangrene in the newborn. L. W. Heffermann.
The late Sir John Williams. Sir F. Champneys. (Correspondence).

June 12th, 1926.

Preventive medicine as applied to obstetrics. A. C. Stark. (Correspondence.)
*Production of immunity by filtrates from streptococci isolated from the vagina in pregnancy. M. E. Robertson.
An improved maternity service. (Leading article).

June 19th, 1926.

*Hæmorrhage about and after the menopause. W. F. Shaw.
*Acute duodenal obstruction due to neo-natal volvulus. A. Baker and V. Mizen.
Gangrene in the newborn. H. R. Frederick and F. W. Robertson. (Correspondence.)
Preventive Medicine as applied to obstetrics. A. C. Stark. (Correspondence).

June 26th, 1926.

Double vagina and single uterus. R. C. Bartlett.
Obstetrics in general practice. J. Cook. (Correspondence).

July 3rd, 1926.

*Study of agglutination of the gonococcin man. C. E. Jenkins.
*Carcinoma of the prolapsed cervix. N. A. Macleod.
Hæmatoma of the abdominal wall. H. N. Gellert.
Obstetrics in general practice. C. L. Day. (Correspondence).

July 10th, 1926.

Obstetrics in general practice. V. P. Norman. (Correspondence).

July 17th, 1926.

Obstetrics in general pracice. C. E. Douglas. (Correspondence.)

July 17th, 1926.

Cancer of the prolapsed cervix. R. H. Paramore. (Correspondence).

August 7th, 1926.

*Indications and methods for termination of pregnancy before the viability of the child.
I. Opening Remarks. C. Berkeley.
II. The indication for induction of abortion. T. W. Eden.
III. Aspects to be considered. A. L. McIroy.
IV. Slow and rapid methods of induction. J. D. Barris
V. Cardiac Indications. F. W. Price.
VI. The plea of insanity. R. H Cole.
VII. The ethical aspect. H. H. Evens.
The development of vaginal operations for genital prolapse. F. A. Nyalusy. (Correspondence).

August 14th, 1926.

*The mechanism of inheritance. F. A. E. Crew.
The science of Genetics. (The Week.)

August 21st, 1926.

Contagious bovine abortion and undulant fever. (The Week.)
The development of vaginal operations for genital prolapse. R. H. Paramore and J. W. Bride. (Correspondence).
Obstetrics in general practice. J Cook. (Correspondence).

August 28th, 1926.

Legal definitions of live birth. G. Carter.
Transverse presentation with normal pelvis and normal child. E. Burke.
Milk as a growth stimulant. S. Neave. (Correspondence).

September 11th, 1926.

Live birth. H. M. Stratford. (Correspondence).
Notification of puerperal fever or pyrexia. R. Hobbs and M. R. Levack. (Correspondence).

September 18th, 1926.

*The place of induction of premature labour in the treatment of contracted pelvis. J. B. Banister.
Strangulated inguinal hernia in an infant sixteen days old. G. H. Buckley.
Puerperal fever puerperal pyrexia. S. N. Scott. (Correspondence).

September 25th, 1926.

*Common mistakes in the artificial feeding of infants. E. Pritchard.

Hæmatoma in the abdominal wall simulating pelvic new growth.

Fully reported on page 730.

Twisted ovarian pedicle in a child.

Morris reports the case of a child aged 4½ years who was operated on for a left ovarian cyst weighing 11ozs. the pedicle showing three turns clockwise. Recovery was uneventful.

Preventive medicine as applied to obstetrics.

In this class lecture, Munro Kerr deals seriatim with the more common complications of pregnancy labour and the puerperum which are preventable and shows how much preventive medicine can accomplish in the field of obstetrics if the care of the expectant mother is undertaken early in pregnancy, if the prospective complications of parturition are recognised and corrected as far as possible, if institutional treatment is made adequate, and if parturients in their own homes are looked after by efficient midwives whose work is supervised by obstetric specialists available at all times in case of necessity.

Production of immunity by filtrates from streptococci isolated from the vagina during pregnancy.

Inoculating mice with broth cultures streptococci isolated from the vagina and with filtrates from these cultures, Robertson obtained results which strongly suggest that protection against the vaginal streptococci may be afforded by previous inoculation with the filtrates from their broth cultures.

Hæmorrhage about and after the menopause.

In this post-graduate lecture, Shaw discusses the commonest cause of this condition and concludes that the one point we must constantly keep before us is the frequency of malignant disease as a cause of hæmorrhage, and the fact that hæmorrhage is usually the only early symptom of this disease, and so we must always consider these cases as likely to be

malignant until we have *proved* the hæmorrhage to be due to some other cause. Malignant cases will then be detected much earlier and a far larger number will be cured.

Acute duodenal obstruction due to ante-natal volvulus.

An 8lb. male infant throve for six days after birth, then began to vomit and died ten days later. Examination of the abdominal viscera suggested a primary malrotation of the gut in a direction the reverse of normal, bringing the colon behind the duodenum, this rotation being arrested by the firm adhesion of the transverse colon to the mesentry of the ileum at the stage where the ileum had passed forward across the duodenum. After birth the irregular peristalsis induced by the obstruction at the duodeno-jejunal flexure and more especially at the junction of the ascending and transverse colons, determined the occurrence of the volvulus which carried the ileum through an angle of 180 degrees across the duodeneum to the left, twisted the superior mesenteric artery tightly across the third part of the duodenum, and thus produced acute duodenal obstruction.

Study of agglutination of the gonococcus in man.

Jenkins shows that agglutinins to the gonococcus are not produced in man when the infection is limited to the genito-urinary system and that in a generalised infection such as arthritis the amount of agglutinin produce is so small and uncertain that the agglutination test as ordinarily performed is of no value for diagnostic purposes.

Carcinoma of the prolapsed cervix.

Macleod points out that cancer is less liable to develop in the prolapsed cervix than in the non-prolapsed, otherwise the associated condition would be more frequent. He records two cases, the first showing carcinoma associated with prolapse, and the second, carcinoma developing soon after a long-standing prolapse was rectified.

Indications and methods for termination of pregnancy before the viability of the child.

I. *Opening remarks.* In opening this British Medical discussion, Berkeley said that the subject was one which members of the medical profession were continually coming up against and even being worried about.

II. *The indications for induction and abortion.* As medical indications Eden discusses pulmonary tuberculosis, chronic nephritis, *bacillus coli,* infection of the urinary tract, diabetes mellitus, heart disease and diseases of the nervous system, and states that the obstetric indications are comparatively few and relatively unimportant, discussing only three, namely, toxæmic vomiting, vesicular mole and retention of the dead ovum.

III. *Aspects to be considered.* McIvoy pointed out that the medical aspects of induction divides itself into two headings, namely, (1) induction for disease complicated by pregnancy and (2) induction for disease due to pregnancy. She stated that in the Obstetrical and Gynæcological Unit of the Royal Free Hospital, out of 5,000 in-patients under treatment, induction of abortion was performed 15 times. Of 29 cases of pulmonary tuberculosis,

abortion was induced in 5 cases. Of 120 cases of heart disease, induction was performed for failing compensation in 3 cases; 2 cases were induced for toxæmia and nephritis, one for progressive disseminated sclerosis, one for progressive tabes dorsalis with paralysis, one for epilepsy, one for arsenical poisoning, and one for acute hydramnios. Advice was given as to the avoidance of future pregnancies, and in some cases sterilization was carried out. X-rays hold a promise of effective sterilization in these cases without the risk of operative intervention.

IV. *Slow and rapid methods of induction.* Barris considers that the application of the slow and rapid methods is governed by two factors: (1) The urgency of the need for the termination of the pregnancy, and (2) the date of the pregnancy, *i.e.* whether before or after the end of the first three months.

V. *Cardiac indications.* Price suggests that in any case in which it has been decided to terminate pregnancy an attempt should first be made to treat the existing cardiac failure, in the hope of affording a better chance of a favourable result of the induction of abortion or premature labour.

VI. *The plea of insanity.* Cole considers insanity during pregnancy to be a somewhat rare affection comprising less than one per cent of the total incidence of insanity in women, the maniac depressive and dementia præcox being the most usual, and that unless accompanied by disease of other organs the mental condition usually does not interfere with the life of the mother.

VII. *The ethical aspect.* Evers gives the three following reasons why induction of abortion should now never be considered: I. An enormous importance is attached to the value of intrauterine life at the present time. 2. Great improvements in medical treatment of most complications have taken place in recent times. 3. The dangers originally urged against pregnancy under certain conditions were mostly of a speculative nature and mostly groundless.

The mechanism of inheritance.

In this British Medical Association lecture Crew discusses succintly and clearly the main facts concerning inheritance. He shows that man, exceptional in many ways, is essentially similar to those forms of life with which the genteticist has worked, and that many of his characteristics, morphological, physiological and psychological are subject to the universal laws of inheritance. Hence, a knowledge of inheritance in the human subject is essential for diagnosis and prognosis in medicines and must also become the basis for any sound and scientific effort in racial improvement.

The place of induction of premature labour in the treatment of contracted pelvis.

Banister considers that:—

1. The wider use of induction of labour in cases of contracted pelvis should be urged, and that this is especially necessary to-day in view of the widespread employment of Cæsarean section. It should be urged because it is simple, safe, and unaccompanied by untoward complications and sequelae.

2. Premature induction of labour is not to be decided upon lightly, but should be dependent upon very careful investigation and frequent examination.

3. It affords the only actual test of the power of a given uterus under conditions which imply a reasonable chance of the survival of the baby.

4. It is an attempt to procure what is rightly regarded as the highest aim of the true obstetrician—a natural parturition.

Common mistakes in the artificial feeding of infants.

Pritchard records a series of cases illustrating common pitfalls in the artificial feeding of infants, and submits that recent development in our knowledge of nutrition has not simplified the feeding of babies, but has rendered it an infinitely more responsible and difficult task.

F. E. T.

The Clinical Journal.

Vol. LV. No. 12. March 24th, 1926.

Some recent methods of investigating the patency of the Fallopian tubes in sterility. H. F. Seymour.

Vol. LV. No. 13. March 31st, 1926.

A case of "locked twins." M. H. Phillips.

Vol. LV. No. 18. May 15th, 1926.

The importance of pre-maternity work in general practice. L. M. Weeks.

Vol. LV. No. 20. May 19th, 1926.

The treatment of "inoperable" ulcerated and fixed cancer of the breast by diathermy combined with the use of radium in the axilla. W. Sampson Handley.

Vol. LV. No. 23. June 9th, 1926.

*Some aspects of ectopic pregnancy. C. S. Lane-Roberts.

Vol. LV. No. 25. June 23rd, 1926.

Difficulties in pregnancy and labour. A. Bourne.

*The treatment of uterine infection by drainage. R. Hobbs.

A uterine fibroid impacted in the pelvis in a woman of 72. M. W. Bulman.

Vol. LV. No. 33. August 18th, 1926.

Dysmenorrhœa. W. W. King.

Vol. LV. No. 34. August 25th, 1926.

The medicinal induction of labour. K. V. Bailey.

Vol. LV. No. 39. September 29th, 1926.

*Abdominal pain in pregnancy. L. Williams.

Some aspects of ectopic pregnancy.

Lane-Roberts gives the following figures regarding advanced cases of ectopic pregnancy :—

1. An operation at term with spurious labour having commenced, the child being alive. Mortality 27 per cent.

2. An operation within eight weeks of labour. Mortality 20 per cent.

3. An operation eight weeks after labour. Maternal mortality four per cent.

The treatment of uterine infection by drainage.

Hobbs gives the following indications for draining the puerperal infected uterus :—

1. If, during the first few days following labour or miscarriage, constitutional disturbance takes place, it is safest to drain the uterus at the earliest possible moment. After a day or two another cause may be found for the rise of temperature, but by procuring drainage no time has been lost.

2. Particular attention should be paid to any abnormal condition of the lochia. One of the most important signs is the persistance of the red lochia beyond the seventh day.

3. Pain is another important sign as it may mean obstruction to the outflow of the uterine secretions.

He states his conclusions thus :—

1. Drugs such as glycerine and salt solution encourage the antimicrobic flow of blood through the infected tissues and affect the course of the disease.

2. The uterus cannot be cleaned in one attempt.

3. The use of strong antiseptics is liable to be followed by an increase of temperature, pain, discharge and hæmorrhage.

4. Septic cases with retained products do far better if drained and no attempt is made at operative interference.

5. The fact that intermittent temperatures occurring in cases of chronic inflammation of the uterus are controlled by drugs which relieve congestion, proves clinically that the primary course is one of chronic inflammation of the endometrium. Therefore is not necessary to use the curette except for diagnostic purposes, viz., in carcinoma and submucous polypi still less is it necessary to perform hysterectomy.

6. The persisence of red lochia is one of the most important signs of sepsis following labour and miscarriage.

7. The problem of saving the worst cases *i.e.* those with blood infection, remains yet to be solved. As Sir Almroth Wright and Leonard Coleman state, continuous research is necessary, skilled laboratory workers acting in close collaboration with those who understand the technique of draining the infected tissues.

Abdominal pain in pregnancy.

Having been unable to devise any scheme for presenting in any rational sequence the various abdominal pains in pregnancy, Williams considers stretching the round ligaments, pyelitis of pregnancy, fibroids and ovarian cysts. As other rare causes of acute pain complicating pregnancy, he cites pyo- and hydronephrosis and thrombosis of veins. He also points out that pain is one of the symptoms of over-distension of the uterus and that it may,

therefore, be met with in the early months in acute hydramnios and in hydatidiform mole while in the later months discomfort rather than actual pain is found in association with twins and chronic hydramnios.

F. E. T.

The Biochemical Journal.

Vol. xx. No. 2. 1926.

*The effect of ultra-violet light on the calcium and phosphorus metabolism of the lactating animal. J. Mc A. Henderson and H. E. Magee.

Experiments on the chemical nature of the oxytocic principle of the pituitary gland. W. V. Thorpe.

Vol. xx. No. 3. 1926.

The difference in chemical composition of the skeletons of young rats fed (1) on diets deprived of fat-soluble vitamins and (2) on a low phosphorus rachitic diet, compared with those of normally nourished animals of the same age. H. Chick, V. Korenchevsky and M. H. Roscoe.

Influence of diet and sunlight upon the amount of vitamin A and vitamin D in the milk afforded by a cow. H. Chick and M. H. Roscoe.

Vol. xx. No. 4. 1926.

Some phosphorus compounds of milk. II. The liberation of phosphorus from caseliogen by enzymes and other agents. C. Rimmington and H. D. Kay.

Studies on the effect of heat on milk.

I. Some physico-chemical changes induced in milk by heat.

II. The influence of diets of fresh and treated cow's milk on the calcium phosphorus nitrogen metabolism of the young P.S . H. E. Magee and D. Harvey.

The effect of ultra-violet light on the calcium and phosphorus metabolism of the lactating animal.

Irradiation of lactating goats by the carbon arc lamp reduced the faecal excretion of calcium, the effect on phosphorus excretion being less constant. It seems probable, therefore, that irradiation increases the stimulus to calcium storage during pregnancy and diminishes the calcium loss during full lactation.

There also seems to be some ground for concluding that depletion of minerals in lactating animals may adversely affect breeding and milk production and may also increase susceptibility to tuberculosis. Further, whilst minimising such depletion the composition of the diet is of special importance. Ultra-violet irradiation would seem to be a valuable adjunct.

Experiments on the oxytocic principle of the pituitary gland.

Thorpe found that the destruction of the oxytocic principle of the posterior lobe of the pituitary gland by ordinary "trysin" preparations is due to their trypsin and not to their lipase content. This supports the hypothesis that the principle contains a peptide linkage in its molecule.

The influence of sunlight and diet on milk.

Chick and Roscoe found that the milk contained the maximum amount of both fat-soluble vitamins A and D when the cow was out at pasture in summer, and that butter made from milk possessing anti-rachitic potency preserves this property after storage in the frozen condition for more than two years.

They also call attention to the disadvantage of confining milking cows in stalls when the milk is required for the nutrition of infants and young children.

Studies on the effect of heat on milk.

Magee and Harvey suggest that heat has a detrimental effect on the nutritive value of milk, and that one of the important contributing factors is reduction in the amount of soluble calcium.

F. E. T.

The Journal of Physiology

Vol. LXI. No. 1. March 18, 1926.

*The action of adrenalin and ergotamine on the uterus of the rabbit. J. H. Gaddum.

Vol. LXI. No. 3. June 22, 1926

*The action of pituitary extract upon the pregnant uterus of the rabbit. H. H. Knaus.

Vol. LXI. No. 4. August 6, 1926.

*Studies of the internal secretion of the ovary. I. The distribution in the ovary of the œstrus-producing hormone. A. S. Parkes and C. W. Bellerby.

*The relation between the corpus luteum of the mammas gland. G. Drummond-Robinson and S. A. Arydell.

The action of adrenalin and ergotamine on the uterus of the rabbit.

Cutting the rabbits uterus in pieces and testing with ergot alkaloids and adrenalin according to the method of Broom and Clark, the following results were obtained by Gaddum: ergotamine acts in two stages of simple diffusion into the muscle, and by a further process within the muscle, the complete effect taking more than twenty minutes to effect. It increases the concentration of adrenalin necessary to produce a contraction by an even height, the proportion bearing a nearly linear relation to the concentration of ergotamine, and both stages were found to proceed more quickly at 37° than at 0°. The simplest theory to account for these results entails a number of elements of varying threshold to adrenalin and of varying accessability to ergotamine.

The action of pituitary extract on the pregnant uterus of the rabbit.

Knaus divides his results into three time-groups; (1) from the 32nd backwards to the 29th day of pregnancy; (2) from the 28th to the 18th day; and (3) from the 17th to the 1st day.

In the first group it was possible to induce parturition by the injection of a certain quantity of pituitrin, and complete delivery of the litter

could always be induced, this depending only on the amount of pituitary injected. In the second group death of the fœtus occurred with hæmorrhage into the spongy layer of the placenta, whilst in the third group it was not possible to disturb pregnancy by the injection of any reasonable quantity of pituitary extract.

Knaus concludes that there is ample evidence that abortion occurring at earlier stages of pregnancy cannot be regarded as the effect of any activity of the uterine muscle, but rather as the consequences of some disturbance in the supply of the necessary hormones.

The disribution in the ovary of the œstrus-producing hormone.

Parkes and Bellerby obtained œstrus-producing homones from the ovary but the amount obtained per kilogram of original tissue varied enormously. They consider that there appears to be some correlation between the size of the follicles and the relative activity of liquor folliculi and residual tissue.

The relation between the corpus luteum and the mammary gland

Drummond-Robinson and Asdell found that removal of the corpora lutea in the pregnant goat was always followed by abortion. If the removal was performed before the globulin stage of mammary secretion was reached, milk was not secreted in bulk. Removal of the corpora lutea after the globulin stage was followed by an immediate copious secretion of milk.

The stimulus for growth having been given to the mammary cells by the corpus luteum they appear to be able to reach the globulin stage without receiving a continued stimulus. If by excision the corpora lutea, the stimulus is removed the attainment of this globulin stage is not followed by milk secretion.

Ovulation in the goat is spontaneous. The influence of the corpus luteum upon the mammary gland is shown to be a variable one thus providing a possible basis for the action of genetic factors affecting milk yield.

The theory that an inhibiting hormone prevents or causes a decline in milk secretion until parturition occurs, appears to be unnecessary.

F. E. T.

The Medical Journal of South Africa.

Vol. xxi, No. 9, *April*, 1926.

Gynæcology as a speciality (Editorial).

Vol. xxi, No. 11, *June*. 1926.

*Gynæcology in general practice, R. W. B. Gibson.

Gynæcology in general practice.

This paper was read at a meeting of the Central Rand branch of the South African Medical Association. According to the author, it is merely a collection of disjointed reflexion on some of the gynæcological conditions which are encountered in general practice. The subjects he has chosen for discussion are dysmenorrhœa, pathological discharges, backward displacement of the uterus and extra uterine pregnancy. F. E. T.

The Canadian Medical Association Journal.

September, 1926.

*Modern Evolution of Gynæcology. E. Murray Blair.

Modern evolution of gynæcology.

Gynæcology in the last ten years has outstripped in progressive development all other branches of therapeutic endeavour. Ten years ago operation or nothing was the treatment.

The curette, formerly used in abortion cases—clean or septic—and the cause of numerous deaths, is to-day regelated to diagnostic use in cases of suspected cancer of the corpus.

Three or four years ago amputation of the diseased cervix was the only recognised complete treatment. Trachelorrhaphy was considered a halfway measure. But though amputation led to cures of backache, sterility, and leucorrhœa, it resulted in a ring of scar tissue which could not dilate during labour. Chronic endocervicitis can be cured in many cases by dilation, removal of mucus, application of a germicied, plus the powder treatment of Gellhorn, plus the cautery treatment of Dickenson. Cervical amputation, at or after the menopause in cases of erosion with hypertrophy, is justified as a diagnostic procedure, otherwise it is but a halfway measure.

As regards salpingitis : operation, in acute cases, has long been out of question, and in the chronic cases, is rapidly becoming so.

Curtis taught that one attack of gonorrheal salpingitis (and 90 per cent. of cases are due to the gonococcus) soon cleared up completely. It was subsequent attacks that resulted in chronicity, and these were frequently due to re-infections from foci in the lower genital tract, such as the urethra, Skene's glands, Bartholin's glands, and the cervix. The usual treament of an acute attack—rest, douches, sedatives, ice-bag etc.—should be followed by a vigorous offensive against these foci, especially Skene's ducts and the cervix. The electric cautery is necessary in most cases for both areas. The cervix must always be dilated—but very gently; trauma has led to further attacks.

In chronic salpingitis the cause of recurrence must be treated as above. The best therapeutic agent for chronic inflammation anywhere, and particularly in the pelvis, is heat. Heat promotes circulation and brings leucocytes to the effected area. The best methods for applying heat are by vaginal douches—at 110° to 115° F., given on the back, for half an hour— and diathermy.

In chronic inflammation a desirable leucocytosis is best obtained by protein therapy. To this end the protein therapy must produce a systematic reaction—a mild serum sickness.

The too frequent emloyment of operations for correction of retroversion has done much to discredit gynæcology. Seldom is the uterus fixed by adhesions.

Hot douching followed by 15 minutes walking on hands and knees, then resting in a prone or semi-prone position, can often be followed by manual restoration of the uterus to the forward position.

Ninety per cent. of displacements are puerperal in origin due to the usual employment of the dorsal position. Parturient women should all lie

on their stomachs, beginning not later than the fifth day. All women should learn to sleep in the semi-prone or prone position.

In the treatmentof fibroids X-rays and radium have done much to eliminate operation.

The trend of gynæcology is everywhere to conserve and only to eradicate as a last resort.

J. Lyle Cameron.

The Medical Journal of Australia.

Indications for interference during pregnancy (Correspondence).

January 16, 1926.

Report of the Royal Commission on health. v. Venereal diseases. vii. Maternity hygiene. viii. Child welfare.

February 3, 1926.

*Ovarian malignancy with special reference to Krukenberg tumours. R. F. Matters.

The artificial feeding of infants. (Leading article).

February 20, 1926.

*Stillbirths and early infantile mortality. P. L. Hipsley.

*Causation and prevention of mortality during the first month of life. M. Harper.

Infantile mortality. (Correspondence.)

February 27, 1926.

*Intrauterine transplantation of the ovary and its clinical significance R. B. P. Monson.

*Indication for Cæsarean section. H. C. F. Donovan.

*Indications for interference during labour. R. N. Wawn.

*Treatment of puerperal insanity. P. Lalor.

March 27, 1926.

*The diagnosis and management of persistent occipito-posterior presentations. F. B. Craig.

April 3, 1926.

Hæmaturia in the newborn child. N. Dale.

April 24, 1926.

Triple pregnancy with placenta prævia, abortion and post-partum hæmorrhage. A. F. Brown and F. McK. Dirg.

Adrenalin in apnœa neonatorum. (Current Comments).

May 15, 1926.

Albuminuric retinitis of pregnancy. J. C. Douglas and W. R. Griffiths.

May 22, 1926.

A case of central rupture of the perineum. A. G. E. Naylor.

May 29,1926

*The causes and prevention of maternal morbidity and mortality. H. Jacobs.

June 5, 1926.

*The causes and prevention of maternal morbidity and mortality. H. Jacobs.

A case of tetanus neonatorum. M. J. Plomley.

June 19, 1926.

Pseudomyxoma peritoneum. M. V. Southby and R. Webster.

A case of pseudomyxoma peritonei of appendiceal origin in a female W. G. Cuseaden.

Pituitrin in obstetrics. (Current Comments.)

June 26, 1926.

Occipito-posterior portions. A. J. Gibson.

Breech delivery. H. A. Ridler.

Occipito-posterior and breech deliveries. (Leading article.)

Abdherhalden's cancer test. (Current Comment.)

Ovarian malignancy with special reference to Krukenberg tumours.

Matters notes that Sampson Handley considers that the ovary is a very receptive medium for invasion of malignant cells, and that many cancer cells falling into the abdominal cavity of a female were more liable to produce metastic growths in the ovaries than in the other tissues of the lower abdomen. He instances several cases in which a primary cancer of the breast had secondary deposits in the ovary due to the cancer cells travelling by "permeation" through the fascial planes to the epigastrium and there entering the abdominal cavity.

He then describes the Krukenberg tumour, formerly known as *fibrosarcome cellulare carcinomatodes*, which has been shown by Erdheim and Schiller to be a pure carcinoma and always secondary to carcinoma of the gastro-intestinal tract or of the gall bladder. The cancer cells from these parts fall on the ovary and become implanted there, but, being secreting cells, continue to produce secretion and become distended, as there is no gland lumen into which to pour the secretion. These cells are not closely packed together, but invade either in small groups or in a diffuse form and they are surrounded by the ovarian connective tissue.

The distension of the cell by its own secretion produces a globular shape and the nucleus is pushed to one side and flattened against the cell membrane, so that in a well stained slide the appearance is typical and the cells resemble signet rings, and Krukenberg once called it the "signet ring tumour." The distension of these cells has a pronounced irritative effect upon the connective tissue and so stimulates it that it has the appearance of a fibrosarcoma, whence the old name was derived.

Microscopically these Krukenberg tumours are smooth, the surface is bossed and the whole ovary appears to have undergone enlargement. The tumours feel rather sponge-like and not so much of a cystic sensation exists, although the sensation of elasticity is present.

The origin of the primary tumours varies, but in a series of five cases the primary condition was found twice in the gall bladder and three times in the pylorus and pyloric antrum.

In view of these findings it seems necessary to regard the ovary as a possible site for metastases in many cases of abdominal malignant disease and this organ should always be suspected in these cases. Bonney states

that the ovaries in many of his Wertheim operations appeared macroscopically unaffected by cancer, but on microscopical investigation, cancer cells have been found in a very large number of cases. Bonney also points out that this occurs "where there is no reason for suspicion from the lymphatic channels if regarded anatomically." Possibly the ovarian vessels in these cases may cause the metastasis or possibly the distribution ocurrs by "permeation."

The conclusion is that cancer cells find in the ovary a suitable medium for multiplication so that it is essential before considering an ovarian carcinoma as primary to eliminate the possibility of the tumour being secondary to any uterine, abdominal or breast carcinoma.

Stillbirths and early infantile mortality.

Hipsley considers that more infant lives are lost from maternal disease than from the complications of labour. Toxæmia associated with albuminuria and ante partum hæmorrhage, many cases of which are also associated with albuminuria, accounted for the greatest number of deaths. The number of infants dying as a direct result of childbirth is, still far too large, but probably many of these infants would have died as a result of congenital debility or prematurity, even though no complication had existed at birth. This applies particularly to breech births and prolapsed cord, both of which are far commoner with premature infants.

It is evident, therefore, that in order to save more infant lives we must direct our main efforts to the improvement of the health of the mother during pregnancy by the establishment of an increased number of antenatal clinics under the direct supervision of specially qualified doctors and nurses. There should also be prematernity wards in all obstetric hospitals, where the patients are under the care of an efficient staff of specialists in all departments working in co-operation with the obstetrician. It might well be discussed where the duties of the obstetrician cease and those of the other specialists come in. The pregnant woman is liable to all the ailments which affect her non-pregnant sister, together with others peculiar to herself and the same applies to the infant. If the obstetrician has piloted the woman safely through her pregnancy and confinement, there should seldom be any special care needed for the infant. Probably a greater saving of infant lives would result from a closer cooperation between obstetrician and pædiatrician. The adoption of the system in vogue in some of the American hospitals, where the patients are visited periodically by a group of physicians and surgeons working in conjunction, would probably add considerably to the efficient working of the modern obstetric hospital.

Causation and prevention of mortality during the first month of life.

According to Harper, the following are some of the means by which the present high mortality rate of premature infants and weaklings may be reduced :

1. In the course in pædiatrics given to the medical student stress should be laid on the fundamentals of infant hygiene and infant feeding. Students should be taught the details of the care and handling of these babies. They should be prepared to recognise and overcome the special difficulties which arise in the first few weeks of life. Though teaching, both theoretical and

practical, in the methods of establishing lactation during the period of time when the infant is unable to suck, should be given. The fact that all healthy premature babies given proper care from the moment of birth can be saved and that experience shows that it is worth while to save these babies, should be impressed upon them.

2. Every midwifery nurse should receive as part of her training instruction in what is known as mothercraft, that is methods of handling, feeding and caring generally for the new-born infant, the methods of establishing lactation when difficulties occur and special teaching in the care of the premature baby.

3. Provision should be made in every maternity hospital for a properly equipped room for the treatment of premature infants and for special nurses to care for them. These infants require constant individual care and the attention of a nurse night and day until they are strong enough to be treated as full-time babies. The feeding of these infants is often a slow and tedious process. The attacks of cyanosis and apnœa which not infrequently occur, require immediate attention, otherwise the baby may be found dead in bed. Abdominal distension must be watched for and relieved. In fact, there are many details of care which must be carried out, if the baby is to survive, and which can be carried out efficiently only by one whose whole time is given up to the infant.

Intra- uterine transplantation of the ovary and its clinical significance.

Monson recommends implantation of the ovary into the uterine cornu in cases of double salpingectomy in patients who desire to retain the possibility of child-bearing.

Indications for Cæsrean Section.

Donovan considers that valuable as Cæsarean section is it shows symptoms in some quarters of becoming a vogue and hopes that this discussion will help to crystallize its indications.

Indications for interference during labour.

Waun discusses the numerous conditions arising during labour which call for interference, and points out that many of them can be avoided by a careful preliminary examination.

Treatment of puerperal insanity.

Recording seven cases of Labour emphasises :—

(i). Early treatment when the patient is admitted to a receiving house or mental hospital.

(ii) The adoption of preventive treatment in patients who are known to have had puerperal mania and who had subsequently become pregnant.

(iii). When toxæmias of pregnancy such as hyperemesis or threatened eclampsia, are known or are suspected to be likely to occur by the obstetrician, vaccine treatment should be used from a prophylactic point of view, owing to the possibility that the condition of the patient might subsequently become one of puerperal mania.

The diagnosis and management of persistent occipito-posterior presentations.

During 1924 there were twenty-five cases of persistent occipito-posterior presentation in 1,595 deliveries in the Royal Hospital for Women, Sydney. For prophylaxis Craig recommends Buist's method, and for the established condition, (1) flexion of the head; (2) manual rotation of the head; (3) forceps; and (3) craniotomy.

The causation and prevention of maternal morbidity and mortality.

In a lengthy prize essay, Jacobs points out that prenatal care and the proper conduct of labour will reduce the mortality to a very small but nevertheless significant factor, and that morbidity must still occur, though to a very limited extent. He stresses the fact that the entire medical profession must be brought to realize that antenatal care and strict asepsis in obstetrics are essentials and that unnecessary interference will have to be accounted for to an educated and comprehending public. He also pleads for the better education, training and knowledge of the graduate, student, nurse and general public alike.. F. E. T.

American Journal of Obstetrics and Gynæcology.

May 1926.

*A classification of the toxemias of the latter half of pregnancy. H. Stander and C. Peckham.

*Report of a case of actinomycosis of the tubes and ovaries. J. Draper and W. Studdiford.

Diverticulitis of the colon. J. Erdmann.

*Oviduct insufflation based on a study of 400 cases. A. J. Rongy.

*A study of end-results of operations for uterine prolapse at the Women's Hospital, 1915—1925. E. A. Bullard.

Infection of the abdominal incision, incidence in five hundred gynæcologic laparotomies. C. Macfarlane.

Blood pressure and urinary findings in 100 cases of normal pregnancies. F. Faught.

The passive hyperæmia treatment of chronic cervicitis. G. Moench.

*The conduct of labour after Cæsarean section. A. Gladden Jr.

*The mechanics of birth injuries, their cause and prevention. J. Newman and W. Levy.

*Obstetric shock. E. L. Stone.

Ligation of the inferior vena cava. O. G. Pfaff.

On the need for a urologic department in every gynæcologic clinic. H. Halsted and I. Wilens.

Large fibromyoma of cervix: case report. F. Christopher.

Collective Review—The obstetric literature of 1925. J. Greenhill.

Selected Abstracts—Pregnancy complicated by disease.

June 1926.

*A statistical study of the incidence and treatment of labour complicated by contracted pelvis in the obstetric service of the Johns Hopkins Hospital from 1896 to 1924. J. W. Williams and K. C. Sun.

*The improved prophylactic method of treating eclampsia, with comments on the variations suggested by Williams, Stander, Speidel and King. B. Stroganoff.
*Glucose and insulin in the toxæmias of pregnancy. C. J. Miller.
Phocomelus with congenital cystic elephantiasis. H. Harris.
Janeceps asymmetros, with the report of a case. Pack and I. C. Berry.
Subaceous glands in the human nipple. O. Perkins and A. Miller.
Outlet pelvimetry and its importance. C. McCormick.
*The radiotherapeutic menopause: its significance and management. J. Corscaden.
An analysis of seventy-nine cases of placenta prævia. B. Liberman.
The protection of the perinæum. A. Villarma.
*The vomiting of pregnancy, its causation and its treatment by ovarian extract. P. Carter.
Cistern puncture in intracranial injuries. B. Dunham.
A case of fœtal dystocia. H. Thoms.
*Ablatio placentæ. W. Welz.
*Purpura hæmorrhagica complicating pregnancy. F. Liebling.
*Syphilis of the placenta in the negro. J. McCord.
Pregnancy in the remaining horn of a uterus didelphys after torsion and partial hysterectomy. C. E. Caswell.
Lectures in obstetrics to county societies in New York State.
Collective Review—The obstetric literature of 1925. J. Greenhill.

A classification of the toxæmias of the latter half of pregnancy.

FROM a study of 120 admissions of patients presenting one or other type of toxemia of pregnancy. the author suggests the following classification of the late toxemias of pregnancy:—
(1) eclampsia (2) pre-clampsia (3) chronic mephritis (4) eclampsia superimposed upon nephritis (5) "low reserve" kidney.

In many cases an intelligent differential diagnosis cannot be made until the third week of the puerperium.

The authors conclude that eclampsia and pre-clampsia are different entities. They appear to use the latter term in a very restricted sense and thus their researches indicate that it is probably the rarest variety of toxemia with an incidence of not more than 5 per cent of all toxemia patients. It is the stage immediately preceeding eclampsia and should the condition become worse the patient will develop convulsions unless pregnancy is terminated. In the diagnosis of chronic nephritis complicating pregnancy, the authors pay special regard to the diastolic level of the blood pressure during the puerperium. The cases classified under the new term "Low Reserve Kidney" are those with a small amount of albumin some oedema and very rarely headache. The blood pressure is usually 150/90 and quickly returns to normal after delivery. The blood chemistry is normal. Further pregnancies do not injure this type of kidney.

Report of a case of actinomycosis of the tubes and ovaries.

THE authors report a case of what at first appeared to be an example of the rare condition of primary actinomycosis of the female pelvic organs, but at operation a focus was found in the small intestine and another in the omentum. The lymphatic glands contained actinomycotic abscesses. The patient died.

Oviduct insufflation, based on a study of 400 cases.

RONGY only undertakes this examination in hospital lest the patient may require emergency treatment as a result of the test. He uses carbon dioxide gas and confirms patency by fluoroscopic examination. Most of the complicaions which result from the procedure are the result of carelessness in the selection of cases. Pelvic tenderness and purulent discharge are contraindications. Women who suffer from extreme obesity and cardiac disease are often not fit subjects for the test as they are liable to develop syncope. A negative result does not prove conclusively that the tubes are closed because some patients develop spasm of the uterus and tubes which prevents the gas passing through.

The average age of the patients was 27.4 years and the duration of married life 6.45 years. The tubes were found to be patent in 225 cases. One women who had been sterile for eight years gave a negative test on the first occasion but upon re-examination three months later gas passed into her abdominal cavity. She subsequently became pregnant but the author is at a loss to suggest the reason for the different finding which he does not think are the result of tubal spasm. Three patients in whom the tubes were apparently closed subsequently became pregnant. Since then the authors have been guarded in their prognosis! Two patients upon whom the author had performed plastic operations upon the tubes gave a negative insufflation test.

The complications noted in the series included three cases of pelvic infection and two of syncope. The author knows of two deaths which immediately followed this examination and has seen in consultation a very severe case of pelvic peritonitis ending in abscess formation which resulted from this test.

A study of end-results of operations for uterine prolapse at the Women's Hospital, 1915-1925.

VARIOUS operative procedures were adopted in the 361 cases under review. The "complete failures" and the type of operation performed can be readily seen in the following table:

Watkins interposition	(77)	3.0 per cent "complete failures"
Bissell's resection	(12)	8.0 " " " "
Mayo vaginal hysterectomy	(74)	4.0 " " " "
Vaginal pastic only	(81)	7.5 " " " "
Combined vaginal and abdominal	(56)	7.1 " " " "
Abdominal only	(7)	28.6 " " " "
Emmet-Baldwin	(4)	None " " " "

The author has been struck with the success of vaginal plastic operations in the cure of prolapse. The Watkins operation has given very satisfactory results but a considerable percentage of cases developed bladder symptoms. The Mayo operation has been very satisfactory except for an occasional enterocele. The same may be said of Bissell's operation.

The conduct of labour after Sæsarean Section.

GLADDEN collected a series of 21 cases of subsequent pregnancies following Cæsarean section performed for indications other than contracted pelvis. Of these, six were later delivered by a second Cæsarean and two women

lost their lives. Fifteen were allowed to go into labour. Three of these ruptured their uteri and two died. It is only fair to state, however, that two of the cases were admitted after the rupture had taken place. One women had five normal labours after her first Cæsarean section.

If the former Cæsarean section was performed for contracted pelvis the author considers that this operation should be repeated in subsequent pregnancies. Otherwise, provided the convalescence has been afebrile, vaginal delivery is safer. The confinement should take place in a hospital and labour should be induced two weeks before term. Forceps should be applied early in the second stage and delivery facilitated by double episiotomy in order to relieve the strain of the second stage. One successful test of labour after Caesarean section does not guarantee the scar against rupture in all following pregnancies.

The mechanics of birth injuries, their cause and prevention.

NEWMAN and Levy discuss the important question of birth injuries in a fairly long paper which, even if it adds no new facts, serves to emphasize some of the preventable causes of still-births. The high forceps operation, the cause of so many still-births and so many traumatic lesions leading eventually to lowered mentality, should never be undertaken in any institution—least of all in one where obstetrics is practised as a speciality. The application of mid-forceps should be limited to a small number of cases. The authors admit that there are different views amongst obstetricians in regard to the use of pituiritin but they recommend that at least it should be confined to skillful and experienced obstetric surgeons. They appear to favour version provided due care is exercised to avoid injury to limbs and nerves. They consider that the application of forceps to the after-coming head is as dangerous as it is unneccessary.

Obstetric shock.

THE clinical pictures of surgical and obstetrical shock are similar but there is evidence that some additional factors may be operative in the production of shock, complicating delivery. The present paper by Emerson Stone gives a short review of the aetiology and treatment of shock in general, and a record of the known facts of obstetric shock.

Trauma and haemorrhage are the two most potent causes of surgical shock. The chief clinical manifestation is a fall in systolic blood pressure.

Obstetric shock is not particularly common. It has been recorded in labours complicated by a sudden fall in blood pressure whether produced by rapid delivery or the use of drugs. It may occur without hæmorrhage in protracted labour or by unduly forcible efforts to expel the placenta. There is evidence that patients suffering from chronic nephritis or pregnancy toxaemias are more liable to a sudden fall of blood pressure after delivery. The drop in pressure may amount to 100 or more and may make its appearance from two minutes to two hours after labour.

Three cases of obstetric shock have occurred in the author's experience and are reported. The first patient was a multipara who was subjected to Cæsarean section at the eighth month on account of albuminuria. Very severe shock supervened but the patient recovered. In the author's opinion the rapid emptying of the uterus was the only factor which could possibly

be interpreted as subjecting the organism to any strain and must therefore have been the immediate cause of the shock. The second case was one of nephritic toxaemia of pregnancy in which hysterectomy and sterilization by resection of the tubes (*sic*) was performed. The operation was uncomplicated and the blood loss relatively light. Shock sudenly appeared and the patient died. A third patient suffering from albuminuria died of shock occasioned by an unsuccessful attempt manually to remove the placenta. These cases appear to the author to emphasize the toxic element of obstetrical shock in that each of the patients had albuminuria.

A statistical study of the incidence and treatment of labour complicated by contracted pelvis in the obstetric service of The Johns Hopkins Hospital from 1896 to 1924

HERE Whitridge Williams and Ko Chi Sun present a detailed statistical study of contracted pelvis and its treatment. The clinic admits a large number of coloured women and the authors are interested in the comparative incidence and the results in these women as compared to white patients. It appears that labour complicated by contracted pelvis offers a much more serious prognosis to coloured women, yet the foetal mortality is less than with the same degree of contraction in white women.

The gross maternal mortality for all cases of contracted pelvis is 0.97 per cent, but after making certain deductions the net mortality works out at 0.44 per cent. The gross foetal mortality in the series of 2,975 cases of contracted pelvis under review is 4.77 per cent. In computing the net results cases in which the child was dead on admission can be eliminated, but the tables do not give the necessary data upon which to compute the figure nor do the authors supply it. They make it clear, however, that while at the beginning of the period the net foetal death rate was 4.73 per cent it has now fallen to 2.51 per cent.

During the twenty-eight years covered by the study the treatment has undergone many changes. In the first ten years the version was the operation of choice. The following five years saw the trial of pubiotomy and in this period no less than 40.0 per cent of the cases of contracted pelvis were treated by this method. Gradually, however, the operation has been resorted to less and less and it has not been performed at all during the past five years. Since the year 1910 caesarean section has accounted for 64.43 per cent of the operative deliveries. The classical operation has been usually adopted except in cases of sepsis when Cæsarean hysterectomy has been the operation of choice. This latter has been to some extent displaced by the low cervical operation though the authors do not share the enthusism of many of the advocates for this new technique. They allow that it has a place in the treatment of contracted pelvis when a patient is seen late in labour. Since no woman in the series has lost her life from this operation they consider that the outcome must be regarded as "satisfactory" but the convalescence after Cæsarean hysterectomy is smoother.

The clinic was opened in 1896 and from then until 1905 distructive operations upon the child amounted to 10.61 per cent. of the total operations for contracted pelvis. From 1905 until 1910 (during the period in which pubiotomy was under trial) the destructive operations fell to 1.67 per cent. but they have since risen to 13.12 per cent. Without doubt there is

an explanation for these astounding figures, which are especially disconcerting in that they come from a hospital with a highly specialised antenatal department, but they have unfortunately escaped comment in the text.

The improved prophylactic method of treating eclampsia with comments on the variations suggested by Williams, Stander, Speidel, and King.

This paper by Stroganoff is an apologia for his method and a complaint that his exact technique is not followed. He asserts that it gives the best results and he is unable to understand why it is that, after the many thousands of cases which have been successfully treated, the attitude of physicians towards it has not been changed. Further statistics of a series of 300 cases are here recorded. The uncorrected mortality is only 2.6 per cent. Otherwise the article does not add anything to his previous writings upon the subject, nor does it explain in what way obstetric surgeons have so far misunderstood his treatment as to be unable to duplicate his results.

Glucose and insulin in the treatment of toxæmias of pregnancy.

Since post-mortem findings have shown that fatty necrosis of the liver is almost constant in fatal cases of toxæmia, and since clinically it appears that the metabolic factor at fault is the temporary lack of glycogen. Jeff Miller argues that if the liver damage is not too grave the liberal administration of carbohydrates should effectually check the toxæmic process, particularly if the utilization of the carbohydrate is hastened by the addition of insulin. His method of treatment is therefore to administer intravenous glucose (5 per cent.) with hypodermic injections of one unit of insulin for each 3.0 grams of glucose up to ten to fifteen units.

He has made no detailed study of his records but he can safely say that in the last five years at least forty cases of toxæmia and twenty of eclampsia have been treated by his modification of Stroganoff's method with "excellent results," and that latterly since the addition of insulin the results have been "even more brilliant."

The radiotherapeutic menopause: its significance and management

This study by Corscaden is a purely clinical analysis of menopausal symptoms following X-ray or radium therapy. He has divided his 206 cases into three groups; those under the age of twenty-five in order to study the alterations in physical characteristics in the young; those between twenty-five and thirty-eight to include the childbearing period; and those of thirty-eight and over because this age is commonly regarded as being the limit of the spontaneous menopause.

The problem was tested from many points of view including earning capacity, weight, apparent age, libido, blood pressure, so-called 'climacteric arthritis," nervous conditions and hot flushes. The author records a uniform improvement in the earning capacity, and, for the most part, an average increase in weight of not more than six pounds. There were only a few instances of great increase in weight, obesity was not therefore a prominent symptom of the artificial menopause. Age-appearance is difficult to appraise, but judged by the usual standards of grey hair and wrinkling and alteration in the texture and colour of the skin, only two

women suffered these changes sufficiently suddenly for them to be considered to be the result of the cessation of menstruation. This manifestation was especially studied in the younger women in whom the only difference noted was that the skin appeared more sallow. Libido was unchanged in the majority of cases. The author has so far found no facts to support the suggestion that there is a special form of arthritis resulting from the artificial climacteric. Hot flushes are so constant as to be regarded as a normal symptom of the menopause, and there appears to be a constant increase in the blood pressure of 20 mm. in women over 38 years of age. The most interesting observation was that the nervous condition of the patient was unchanged or actually improved in 62 per cent. The position of "inferiority" sex" and other "complexes and repressions" are discussed in relation to menopausal symptoms, but the author does not think that they are the direct result of the loss of ovarian secretion. Hence though hot flushes can be controlled by ovarian extracts, he does not use them because the discomforts are mostly sensory and psychic disorders should be treated by psychotherapy.

The vomiting of pregnancy, its causation and its treatment by ovarian extracts.

Carter says that possibly the three most popular theories which have been advanced in connection with vomiting of pregnancy are those based upon absorption, endocrine abnormalities and metabolic disturbances. He concludes therefore that we are still in the dark as to the causation of the disease. Never-the-less he treats cases upon an endocrine theory based upon the hypothesis that the ovary fails to produce a hormone which in turn, fails to call forth the secretion of pituitary substance into the cerebro-spinal fluid. As a result of this, toxæmia follows which may be neutralised by saturation of the patient with ovarian extract.

He gives ovarian tablets to slight cases of vomiting, but administers the extract hypodermically in those in whom the symptoms are more severe. In the worst cases he injects both ovarian extract and luminal sodium and administers rectal or subcutaneous injections of glucose. He records three cases, two of which recovered and the third had abortion induced.

Ablatio placentæ.

Welz reports the clinical details of seven patients with this complication of pregnancy. He treated two by manual dilatation of the cervix and both died. Three were treated by Cæsarean hysterectomy and one died and two who had spontaneous labours recovered.

Purpura hæmorrhagica complicating pregnancy.

Liebling reports a case of this rare condition of which there are said to be only 48 similar cases upon record. The occurrence of this condition in both mother and child, as is this case, is still more uncommon. Rushmore is quoted as having only been able to find seven such cases in the literature. The blood platlet deficiency in purpura complicating pregnancy probably arises as a toxæmia from maternal, fœtal or placental sources. In the case here recorded, both the mother and the child recovered under treatment by calcium lactate.

Syphilis of the placenta in the negro.

Syphilis was demonstrated in 15.4 per cent. of the 1,000 placentæ examined. Twenty-two per cent. of 966 women had a positive Wassermann, and the blood from the cord was positive in 0.7 per cent. Syphilitic placentæ was found in 40.6 per cent. of the positive Wassermann series, and in 0.3 of those who gave a negative blood test. In 84 premature babies born alive the placenta was positive in 28.5 per cent. while in a similar number of still-born premature infants, the placenta was positive in 67.8 per cent. The cord Wassermann was only positive in 14.5 per cent. of the maternal positive tests, and in 0.107 per cent. of the negative maternal tests. Of the positive placentæ, 75 per cent. had positive maternal blood tests.

W. W. KING.

Bruxelles Médical.

15th *August*, 1926.

Chronic nephritis and pregnancy. R. Beckers.

26th *September*, 1926.

*Suprasymphyseal Cæsarean section. L. E. Phaneuf.

3rd *October*, 1926.

Causation and treatment of metrorrhagia in young girls. Beckers.

24th *October*, 1926.

Pedunculated subserous myoma, presenting on its surface four large cysts. R. Schockaert.

1st *November*, 1926.

Cancer of the cervix with pregnancy. R. Schockaert.

7th *November*, 1926.

A teratological case. J. Beerens.

Suprasymphyseal Cæsarean section.

The author has performed Cæsarean section by the low method in 203 cases. The mortality was 6.4 per cent., but he points out that some patients were in a desperate state at the time of the operation. In no case was peritonitis the cause of death. His conclusions are :—

(1). The low Cæsarean section prevents septic peritonitis.
(2). Bleeding is less severe than in the classical operation.
(3). Post-operative shock is less, because the intestine is not disturbed during the operation
(4). The puerperium resembles that following a normal delivery.
(5). Healing is more perfect, since the incision is made in the lower non-contractile zone of the uterus.
(6). The danger of rupture of the uterus in subsequent pregnancy and labour is reduced to a minimum. At 32 secondary operations no trace of the former cervical scar could be found; and four normal labours followed the low operation.
(7). An adequate trial of labour can safely be allowed.
(8). Adhesions are very infrequent after this operation.

A. Gough.

La Gynécologie.

June, 1926.

*Research on the contractile properties of the uterine muscle. H. Keiffer.

July, 1926.

*Some thoughts concerning conservative gynæcological operations. P. Petit-Dutaillis.

*The possibility of a cure of cancer of the uterus as a result of an exploratory curettage. A. Babes and M. Paltineanu.

August, 1926.

*Note on the creation of a vaginal cavity by a perineal plastic operation. G. Pascalis.

*The emotional factors in female disorders. P. Petit-Dutaillis.

Research on the contractile properties of the uterine muscle.

Pregnant guinea-pigs were killed with coal-gas, the abdomen was then opened and the uterus was fixed *in situ* with absolute alcohol. The appearances seen are interpreted as follows :—

(1). In the guinea-pig at term, the uterine contractions induced by asphyxia take the form of a sinusoidal wave passing from ovary to vagina or reversely.

(2). The muscular layers show undulations, which may be simple or complex (primary, secondary and tertiary).

(3). The finest undulations give to the muscular bundles an appearance of transverse striation.

(4). The principle points of action on the uterine contents are the points of contact with the internal crest of each wave.

(5). The ovoid form of the ovum, its relative hardness and incompressibility, are mechanical conditions favourable to the action of the sinusoidal wave.

Histological examination of portions of human uteri obtained by Cæsarean hysterectomy reveals appearances which are essentially similar.

Some thoughts concerning conservative gynæcological operations.

In cases of painful prolapsed ovavies, the writer suspends the ovary at one or both ends, the uterus being also supported if necessary in an anteverted position.

When extra-genital troubles are believed to have some relation to the genital organs, which, however, show no sign of gross disease, operation is only to be considered if the symptoms are severe, if its connection with the genital functions is clear, and if medical measures have proved ineffective.

In cases of insignificant local lesions in neurotic patients, there is grave risk that an operation will intensify the nervous instability.

Petit-Duaillis also describes two cases of excision of one horn of a bicornuate uterus, one for painful menstruation crises, and one for torsion with hæmatosalpinx. Both patients subsequently became pregnant and went to term.

The possibility of a cure of cancer of the uterus as the result of an exploratory curettage

A newly-married woman, 22 years old, had excessive menstrual loss accompanied by pelvic pain and pyrexia. Curettage was performed. Some fragments consisted of hypertrophied endometrium with inflammatory changes. Two fragments show a typical epithelial proliferation which was believed to be carcinomatus. A second curettage five days later did not produce any malignant elements. The patient improved and was in perfect health five years later.

Three similar cases are quoted. In each a diagnosis of carcinoma was made, further operation for some reason was not performed, and the patient remained well for a considerable time. The explanation given is that an extremely early carcinomatus change, limited to a superficial part of the endometrium, was completely removed with the curette.

The authors have collected some cases in which cancer was diagnosed after curettage, but nothing found in the uterus after its removal. The same explanation also applies to these cases.

Note on the creation of a vaginal cavity by a perineal plastic operation.

Pascali describes a method in which lateral flaps are obtained from the left gluteal region.

The emotional factors in female disorders.

Nature is responsible for circumstances which cannot be evaded, but which would trouble us less were it not for stigmata for which we have to blame ourselves or our ancestors. Civilization has created conditions to which human nature, especially the female, has not had the time to adapt itself. Excessive addiction to sports, music, motoring, the telephone, the wireless—all may lead to nervous exhaustion. Parents are blamed on the one hand for keeping their daughters in ignorance of vital facts, and on the other hand allowing literature and entertainments of a too stimulating kind. After marriage, trouble may be caused by ignorance, clumsiness or brutality of the husband. Incomplete intercourse and anti-conceptional measures are blamed for many nervous disorders. The general social relations between husband and wife are also important. The author blames literature, the press, paintings, sculpture and the drama for presenting sexual matters in a morbid way.

A. Gough.

Gynécologie et Obstétrique

Vol. xiv. No. 2. 1926.

*Radiological examination of the uterus and tubes after injection of lipiodol. Cotte and Bertrand.

Of the importance of the measurement of the pressure during intra-uterine injections of lipiodol. Béclère.

Present-day methods for the diagnosis of tubal sterility (Critical review). Serdukoff.

Vol. xiv. No.3. 1926.

*Surgical interventions during pregnancy. Brindeau and Juge.
*Post-partum uterine hæmorrhage and Henkel's treatment. Muller.
*The heterotopies of uterine mucosa. Waegeli

Vol. xiii. No. 4. 1926.

*Concerning the technique of the ligamentary fixation of the uterus by Doléris' method. Cotte and Peycelou.
*Adenoma of the uterine cervix. Douay and Soïmarn.
Malformation of the lower part of the body. Serdukoff.
*Concerning pituitrin or hypophyseal extract. René de Cotret.

Vol. xiii No. 5. 1926.

Eclamptic crises without albuminuria appearing on the 22nd day of the puerperium. Amaurosis and diabetes insipidus. A contribution to the pathogenic study of diabetes insipidus in relation to eclampsia. Laurentie and Basilion.
*Patological anatomy of utero-placental apoplexy. Rafael Maestre.
*A manœuvre to facilitate the entry of the head held by forceps at the upper strait. Lantuéjoul.
*Concerning the treatment of uterine retro-displacement. A. Pistuadi.
Congress. Radium-therapy of uterine cancer.

Vol. xiii. No. 6. 1926.

*Concerning the biological action of the corpus luteum. Ancel and Bouin.
*Pathogenesis and histology of acute infections in the nursling. Nicolajew.
*Concerning a hæmolytic fibromyoma of the uterus. Carajannopoulos
A Maternity Home for Tuberculous Women. (Annexe to the Clinique Bandelocque).

Vol. xiv. No. 1. 1926.

*Researches on the physiology of the human amnion. Keiffer.
*The endocrinopathies in gynæcology and their biological diagnosis. Castanó and Del Pont.
*Contribution to the study of the prophylaxis of obstetrical traumas. Serdukoff.
Early interruption of extra-uterine gestation and its relation with the menstrual rhythm. Crainicianu.
Large myoma of the small intestine involving the female genitalia. Muller.
Treatment in malaria. M. Ubago.

Radiological examination of the uterus and tubes after injection of lipoidol.

A useful article dealing with the history, technique, interpretation of results, limitations and risks. Twenty-seven plates, well produced, accompanying it.

Surgical interventions during pregnancy

A short resumé of 113 operations during pregnancy. Operations during labour are not included. The cases were dealt with at the Clinque Tarnier (Paris) between 1907 and June 1926.

Post-partum uterine hæmorrhage and Henkel's treatment.

This treatment consists in the application of compression forceps to the parametrium. The patient is placed in the lithotomy position, the bladder emptied and "a few drops of ether" administered; presumably after a hurried "toilet" the speculum is passed, the cervix drawn down forcibly and then to one side, a lateral retractor then exposes the upper part of the cervix and a four bladed compression forceps is applied enclosing the parametrium. The other side is then treated similarly. The forceps are left *in situ* from 12 to 24 hours. The author records complete success in six cases within a year. (This frequency opens an interesting speculation as to the methods of treament of cases of post partum in the clinic concerned and what the author considers as severe cases of hæmorrhage). It is stated that there is no danger to bladder, uretes or coils of intestine in the pouch of Douglas but even admitting the possibility of damage to the ureter he says the fistula will close spontaneously!

The heteropies of uterine mucosa.

A resumé of the current views on the adenomata or endometriomata. Sampson's, Meyer's and Halbon's views are all considered and criticised without much indication of which is considered most probable; possibly all three views may be correct in appropriate cases. No biology is given.

[In this number of *Gynécologie and Obstetrique* there is a number of abstracts of articles on endometriomata.]

Concerning the technique of the ligamentary fixation of the uterus.

The writers comment on the variations in descriptions of the point at which the round ligament should be picked up—from 3 to 4 cm. from the uterus to "close to the cornu"—the latter to minimise risk of internal hernia between uterus and abdominal wall. They point out that the tubes may be kinked and even dragged into the abdominal wall in some cases and suggest that, before closure of the abdomen, the effect on the tube of the traction on the ligament should be investigated and if necessary the tube freed or another point chosen.

Adenoma of the uterine cervix.

In their pre-amble the writers state that adenoma is common; is little known, because it is confused with cervical metritis; treated with antiseptics, it is not cured because the lesions are not of the inflammatory order; that it is a benign tumour but capable of becoming malignant.

In the main articles, however, much of the description and the drawings would apply equally to the ordinary "erosion-adenoma and adenitis and not to a primary pure adenoma. The treatment is naturally surgical and warning is given that in cases of suspected malignancy the portion chosen for biopsy must be carefully sought and may be deceptive.

Concerning pituitrin or hypophyseal extract.

A resumé with many quotations of the opinion of "the chief accoucheurs of the whole world" received in response to at least 300 questionnaires sent to the United States, countries of South America, Ireland, Scotland England, France Spain, Italy, Portugal ,Roumania, Sicily, and Denmark. The author's view is manifest in his "peroration"—Ergot has survived too long ,let us hope that pituitrin will not have as long a life.

The following questions were asked :—

(1). Can pituitrin be used during pregnancy? In what circumstances and with what object?

(2). Does pituitrin, used during pregnancy, give good or bad results?

(3). Can pituitrin be used during labour?

(4). At what period should it be used?

(5). What is the correct dose?

(6). What are the indications for the use of pituitrin?

(7). What are the contra-indications?

(8). What are the dangers to the mother?

(9). What are the dangers to the infant?

(10). What are the differences between the effects of pituitrin and those of egot?

(11). Are the effects of pituitrin more or less dangerous than those of ergot?

(12). Employed in suitable circumstances, *i.e.* according to the indications and in the absence of contra-indications, has pituitrin caused any accidents?

(13). Do you think that pituitrin is destined to disappear, like ergot, from the list of medicaments suitable for use in labour?

A list of the names of those "almost all professors" who have replied, completes this article.

Pathological anatomy of utero-placental apoplexy.

A report based on five cases. As the predominant lesion, hæmorrhage is found; secondarily, œdema, degeneration of muscle fibres and, with less intensity, alterations in the vessel walls (chiefly thickening of intima) and, occasionally, proliferation of the connective tissues.

A manœuvre to facilitate the entry of the head held by forceps at the upper strait.

Although high forceps operations are usually to be condemned, there may occasionally be indications for such practice. To facilitate the entry of the head, the author has found it useful to bring the legs downward to the Crouzat (Walcher) position and then, maintaining traction, slowly to carry the thighs upward to the usual obstetrical position; after this manœuvre or its repetition the head may be found to be engaged.

Concerning the treatment of uterine displacements.

In praise of the Italian method devised by Pestalozza whereby a musculo-peritoneal flap from the cervico-uterine fold is dissected up and stitched to the fundus. After this procedure 90 women underwent 134 normal labours.

Concerning the biological action of the corpus luteum.

A counterblast to recent publications of Schickele who considers that the follicular apparatus regulates the preparation of the uterine mucosa for the implantation of the ovum and that the corpus luteum maintains the preparation. The writers show that the preparation depends on the develoment of the corpus luteum.

Pathogenesis and histology of acute infections in the nursling.

The writers divide their work into three sections; (1) Etiology—whether by the attack of normally occurring parasitic organisms or an enfeebled host or by the attack of virulent organisms of epidemiological type—the latter they consider to be the commoner. (2) Modifications of the "reactive" tissues *i.e.* the spleen, lymph glands and bone marrow. They consider that these tissues respond sufficiently but that the qualitative response depends on both external and internal factors. (3) Modifications of the thymus, thyroid and suprarenals. They find that acute infections modify the character of the endocrine organs.

Concerning a hæmolytic fibromyoma of the uterus.

In a patient with a moderately large fibromyoma the blood loss did not seem to account for the anæmia, the serum was found to be hæmolytic for her own red blood corpuscles and for those of others. Two days after operation, the hæmolytic power was diminished and it had disappeared nine days later. The fibroid was not the seat of red degeneration, its substance was undegenerate except for a small area of "myxomatous œdema," the juice from this part was negative as regards hæmolytic properties.

Researches on the physiology of the human amnion

By histological and chemical researches the writer believes that the liquor amnii is a true secretion by the amniotic epithelium and the vernix caseosa is also secreted by the amnion. He believes that icterus neonatorum is due to, chiefly, two causes; chilling of the neonate and removal of the vernix. Acting on these views he has practically abolished icterus in his clinic by wrapping the babies up warmly immediately after birth and not interfering with the vernix which he finds is rapidly absorbed. He further suggests that the vernix has nutritive, antihæmolytic, and antimicrobic properties and is antagonistic to certain toxic lipoids. He is trying the effect particularly on weakly babies of the application of lanoline on the skin as being similar to vernix.

Mainly a preliminary report of work in progress and in project. Evidence of the involvement of endocrine glands—and increase in the number of such—is based on the Abderhalden (dialysis) reaction which has been considerably modified. That endocrine disturbances are usually pluriglandular is emphasised; syphilis is held to be responsible for the greatest disturbances. The modifications of Abderhalden's technique are not described.

Contribution to the stuby of the prophylaxis of obstetrical traumas.

Consists of pouring into the vagina, when the head commences showing at the vulva, an unspecified amount of serilisetd "oil of vasiline" probably one of he higher viscosity liquid paraffins. The writer claims a reduction by about one third of ruptures, minor and major of the pelvic floor and slight improvement in the subsequent healing.

R. A. Hendry.

Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.

No. 4. 1926

Metrorrhagic variety of puerperal infection. (Discussion of Couvelaire's paper by Levy-Solal, Ravina, Brindeau, Delestre and Devé).

Two cases of dystocia by Zarate's method for dystocia with the aftercoming head. Brindeau.

Retention of a cotyledon. Infection and haemorrhage; extraction of the cotyledon; abscess of uterine wall; hysterectomy; phlebitis; cure. Le Lorier.

*A case of cyst of Gartner's duct. P. A. Petridis.

The cyst developed in the lower portions of the right labium and clinically resembled a Bartholinian cyst but the anatomical relationships were not quite in order. It contained pseudomucinous contents and was lined by ciliated and columnar epithelium.

*A case of postpartum inversion of the uterus. P. A. Petridis.

A curious case. The inversion, although felt per vaginum, was not recognised until the eighth day. Hysterectomy was recommended and refused; on the 11th day hysterectomy was again refused. In the text there is no mention of any direct attempts at reduction. Phlegmasia alba dolens developed on the 21st day.

On the 39th day the patient took her discharge refusing a proposal of a reduction by surgical means during the near future.

Three months after the labour the family doctor, by means of tight vaginal packs brought about reduction of the inversion. In 1924, the patient became pregnant and delivered herself of a healthy infant but required manual removal of the placenta (the year of the inversion is not stated).

Apparatus for insufflation of tubes. (Tubo-permeabili-meter). Laurentie and Moussali.

SOC. D'OBSTET. ET DE GYN. D'ALGER.

Chronic appendicitis becoming painful during the sixth month of pregnancy. Constantini and Vergoz.

Dermoid cyst of the ovary becoming impacted during pregnancy. Constantini, Vergoz and Ferrère.

Torsion of the right tube by a parovarian cyst at the fourth month of pregnancy: laparotomy; delivery at term. Ferrari.

Haemophilia in a neonate: cure by intravenous transfusion of 20 c.c. of citrated blood after failure of subcutaneous transfusion (of blood). Jahier and Goinard.

Rachitic pseudo-osteomalacic pelvis; foetal death; amniotic infection; threatened uterine rupture; Porro operation; cure. Houël and Jahier.

Fatal colibacillary pyaemia. Laffont, Houël and Jahier.

REUNION OBSTETRICALE DE LILLE.

*Wolffian epithelioma of the ovary. Delannoy and Breton.

One of the interesting solid tumours of the ovary; unilateral and containing a few small cystic spaces; the bulk of the tumour 10 × 8 × 5 cms.

was composed of tubules, closely packed and lined by a single layer of high columnar epithelium. In the deeper parts of the tumour where the cysts were mostly found the epithelium was less columnar and formed several layers.

There were no metastases and, at operation, no ascites were present. It is possible that this may be one of the rare solid adenomata of the ovary. No after history is given.

Fibroid of the cervix. Vanverts.

Spontaneous delivery after Caesarean section and symphysiotomy in a congenital syphilitic with hemi-chorea and hemi-athetosis. Béghin

Further to the discussion on Caesarean section in placenta praevia. Paucot.

REUNION OBSTETRICALE ET GYN. DE MONTPELLIER.

Uterus didelphis with single vagina; retention of dead macerated foetus in left uterus. V. Riche.

The author seems quite certain that the cervical portion of the left horn was rudimentary and that there was only one cervix in the vagina, viz., that belonging to the right horn.

To account for the pregnancy in the left horn is difficult except on the assumption that the uterus was of the bicornis unicollis type rather than the true didelphis.

Mole (hydatid) and hysterectomy. L. Devèze.

*Hydatid mole and malignant placentoma. E. Godlewski.

A very malignant variety; total hysterectomy at the third month of the gestation owing to severe general symptoms; the uterine wall was already invaded by the chorionepithelioma. Death with nodules in the liver, 18 months later.

Renal tuberculosis and pregnancy. Vallois and Coll de Carrera.

*Spinal anaesthesia in gynaecology. Devèze.

*Concerning spinal anaesthesia in obstetrics. A. Rourne.

*Spinal anaesthesia in obstetric cases. Madon.

*Spinal anaesthesia and internal version. Delmas and Coll de Carrèra.

*Spinal anaesthesia in the gynaecological clinic. de Rouville and Madon.

*Concerning spinal anaesthesias. P. Delmas.

*The choice of anaesthetic in gynaecology. E. Forgue.

All the above are enthusiastic on the advantages of spinal anaesthesia.

No. 5. 1926.

The physiology of the amnion. Keiffer.

Evidently a short abstract, the place of publication of the full article not being given. The author suggests that the vernix is derived from the amnion and is collected on the exposed parts of the foetus, that the vernix should not be removed but left to be absorbed by the foetus thereby lowering the percentage of haemolytic icterus to a negligeable amount instead of the 50—60 per cent reported by Porak. Also that the date of "full time" is the result of the secretory activity in cholesterides and glycerides of the amniotic epithelium.

Concerning the low transperitoneal Caesarean section. Portes and Risacher.

Fatal cardiac accidents supervening fourteen hours after labour. Old standing mitral disease with recent acute lesions. Désnoyers.

The calcium content of the human placenta. Coisset and Vignes.

SOC. D'OBSTET. ET DE GYN. D'ALGER.

*Ovarian cyst ruptured in the peritoneal cavity. Constantini and Vergoz. Spontaneous rupture of one locule of a large cystadenoma; no acute symptoms.

Urethro-vesical prolapse, resection of mucosa and anterior myorraphy (colporraphy). Costantini and Vergoz.

*Caesarean section at the onset of labour in a "uterus infraseptus unicorporeus." Laffont and Jahier.

A single uterine body with two cervical canals. The writers state that the cavity was single but from the data given it is impossible to say that the septum did not extend throughout body and cervix.

An observation of high, delayed pain in a case of tubal rupture. Laffout, Houël and Cortés.

SOC D'OBST. ET DE GYN. DE BORDEAUX.

Two cases of prolapse of treated by total colpectomy. Guyot and Princeteau.

Torsion of the pedicule of a parovarian cyst. Lacouture and Favreau.

Ruptured extra-uterine gestation on the left with ovarian cyst on the right. Guyot and Princeteau.

On a case of separation of a normally situated placenta of doubtful origin. Balard.

Severe vomiting at the end of pregnancy. Tetany during the puerperium. Anderodias and Balard.

Severe hæmorrhage from a cervical tear, twelve days after a high forceps delivery for contracted pelvis. Péry, Balard and Mangé.

Ruptured tubo-interstitial pregnancy. Péry, Boursier and Mangé

Fibroids with multiple degenerations. Roche.

Fatal termination of a long-standing vesico-vaginal fistula. Guyot and Princeteau.

Para-urethral abscess communicating with the urethra in a woman. Guyot and Princeteau.

REUNION OBST. ET GYN. DE LYON.

On the radiographic investigation of the uterus after injection of lipiodol in sterility and dysmenorrhœa. Cotte and P. Bertrand.

Concerning the conversion of face presentation to vertex. Planchu.

Specimen of phocomelus. Voron and Malartie.

Cancer of the breast and pregnancy. Eparvier and Santy.

Formol poisoning in an attempt to procure an abortion: (fatal). Commandeur and Brochier.

Hereditary syphilitic stigmata at birth. Commandeur and Rhenter.;

A case of low transperitoneal Caesarean section. P. Trillat.

Low fibroid, conservative Cæsarean section; subsequent pregnancy, Cæsarean hysterectomy. Gonnet, Patel and Planchu.

Two cases of fibroids with pregnancy. Commandeur and Villard.

Multiple fibroids of the pregnant uterus; threatened abortion at 4½ months; abortion impossible by high incarceration of the fœtus; immediate subtotal hysterectomy. Commandeur, Eparvier and Villard.

Two cases of fibroids with pregnancy. Villard.

Dwarf 1 m. 17 cm. with pelvis allowing natural labour. Voron and Malartre.

Three observations of premature labour in women after previous Cæsarean sections. Gonnet.

Five cases of hebotomy in pelvic dystocias. Dujol.

*Spontaneous labour in a case of previous Caesarean section. Dujol.

Original Cæsarean section for placenta prævia, pelvic contraction and malpresentation. In subsequent pregnancy, labour came on spontaneously at eight months and resulted in forceps delivery of living infant weighing 2½ kilos.

Radiography at 4½ months. Photograph. Trillat and Badolle

Flat pelvis; application of Gigli saw; version; living infant 4.3 kilos. Trillat.

Soc. D'OBSTET. ET DE GYN. DE STRASBOURG.

Full-time tubal gestation retained four to five months; laparotomy; extirpation; cure. C. Maret.

Concerning the diagnosis and treatment of dysmenorrhœa. Kreis

Concerning the premature separation of the normally situated placenta. D. Burger.

Bilateral suppurating salpingitis and peritonitis at the onset of pregnancy; Extirpation of tubes; Continuation of pregnancy. Reeb.

No. 6. 1926.

A case of uterine fibroid as a cause of intraperitoneal hæmorrhage in the puerperium. Lantuéjoul.

Abortion probably due to a streptococcal endometritis; further pregnancy, streptococcal pyelonephritis, vaccinotherapy, normal labour at term. H. Vignes.

*A case of partial incarceration of a 7½ months pregnant uterus; conservative Caesarean section. Levy-Solal and Cleisz.

Incarceration of retroverted gravid uterus with retention at three months required a single catheterisation; evidently the uterus became or remained adherent and developed at the expense of the anterior wall. Premature onset of labour sent her to hospital; the tumour in the pelvis—really the posterior uterine wall—was taken to be an ovarian cyst and the condition was only recognised on eventration of the uterus.

The importance of feeding infants in a physiological attitude. P. Robin.

Results of 17 cases of low conservative Caesarean sections. Le Lorier.

Two subtotal hemi-hysterectomies (for accidents inherent in two cases of uterus bicornis unicollis) both followed by full-term pregnancies. P. Petit-Dutaillis.

REUNION OBSTET. ET Gyn. DE NANCY.

Tangling of cords in a case of mono-amniotic twins. H. Vermelin.

Cancer of the cervix and pregnancy. Job and Hamant

Tuberculosis of the ovary. A. Guillemin.

Acute peritoneal tuberculosis in the puerperium, simulating a puerperal infection. A. Fruhinsholz.

*Concerning the treatment of a case of abnormal adhesion of the placenta. Levy.

Placental adhesion was reported in the third and fourth pregnancies, the fifth terminated in abortion at two and a half months (no note is made as to adhesion at that time). In the sixth pregnancy the patient was admitted to hospital in profound shock after failure of attempts at removal. Treatment was directed to alleviation of the shock and a placenta was removed five hours later.

SOC. D'OBSTET. ET DE TOULOUSE.

Central placenta prævia treated by Simpson's method. Daléas and Galy Gasparrou.

Degenerate cyst of right ovary filling the pelvis and leading to severe pressure symptoms. J.-P. Tourneux.

*Two cases of solid tumours of the ovary. Dambrin, Bernardbeig and Thomas. Histological details details not given.

Aortitis and pregnancy. Andebert and Morel.

*Treatment of severe pyelonephritis in pregnancy. Garipuy and Martin. In spite of prolonged medical treatment the condition persisted and the general condition deteriorated markedly. Premature labour was induced at seven months with maternal recovery.

The chart reproduced shows a steady, though slight, drop in pulse and temperature during the five to six days preceding intervention.

Biermer's Anæmia after labour cured by repeated small blood transfusions. Andebert, Bonhoure and Galy-Gasparrou.

Measles followed by premature labour in a woman with congenital narrowing of the pelvis. Daléas and Galy-Gasparrou.

On the anatomical relations of the utero-ovarian pigment in certain tumours of the ovary growing into the blood ligament. Bernardbeig.

Cæsarean section complicated by subacute dilatation of the stomach and retention of lochia by anteflexion and closure of cervix. Andebert.

On the accidents of axial torsion of the uterus. L. Dieulagé

*Fatal melæna in a neonate, two days old, with intussusception. Garipuy and Mediêl.

An infant, apparently previously healthy was found dead in its cot, 48 hours after birth. Linen etc., bloodstained by black blood coming from anus. At the autopsy an intussusception at the junction of lower and middle thirds of the small intestine was found, no peritoneal reaction was present. The authors have no doubt that the hæmorrhage arose from the intussusception; they do not discuss the possibility of the intussusception being terminal or *post mortem*.

Note on a case of pernicious anæmia during pregnancy treated and cured after repeated small transfusions. Garipuy.

SOC. BELGE DE GYN. ET D'OBSTET.

Calcified ovary. Considerations on sterility. Heurotay.

Premature separation of a normally inserted placenta at six months; Caesarean operation. Schockaert.

Vaginal hysterectomy for complete prolapse in a nulliparous octogenarian. Schockaert.

Concerning a post-partum intestinal occlusion. Rouffart.

Physometra; hysterectomy; death. Andebert, Fournier and Rascol.

Extra-uterine pregnancy; diagnostic error; the pseudo-placenta. Laurentie.

Bubonic plague and pregnancy. Laurenti and Tyan.

Delivery induced and rapidly terminated in a case of insanity of pregnancy with acute mania. Andebert and Daléas.

Kyphotic pelvis; Cæsarean section; Death due to perforation of an unrecognised pyloric ulcer. Fournier, Daléas and Galy-Gasparrou.

Innocent placental tumour. Baux.

Large angioma of the arm of a neonate. Baux.

Coelosomian monster. Baux.

Hæmatoma of the cord causing intra-uterine death of the fœtus. Andebert and Sorel.

Two cases of pregnancy after double appendage disease treated by Deblet's vaccine. Daléas.

SOC. BELGE DE GYN. ET D'OBSTET.

Myomectomy during pregnancy. Schockaert.

Irreducible praevial dermoid cyst necessitating Caesarean section. Schockaert.

Present day results of radium treatment in cancer of the cervix. Rouffart.

Modern methods of radium-therapy, deep therapy with gamma rays. Sluys.

Radium-treatment of cancer of the cervix. Delporte and Cohen.

Two cases of fibroids complicating pregnancy. Researches on the histo-physiology of the smooth uterine muscle. Keiffer.

Concerning the Baldwin operation. Brouha

Uterine rupture. G. Nolens.

Experimental observations on the liquor folliculi. Brouha and Simonnet.

Concerning the indications for low Cæsarean section. Brouha.

No. 7. 1926.

On partial incarceration of the pregnant uterus. Metzger.

*Normal process of pregnancy in a woman previously submitted to Porter's operation. Couvelaire.

The first reported case of pregnancy after Porter's operation (Cæsarean section with temporary eventration of the uterus). The first operation was performed in July 1924. A simple Cæsarean section sufficed in July 1926; the uterus was quite free and the scar sound.

*Radiographic study of the venous anastomoses of a triplet placenta. Levy-Solal and Dælsace.

Contrary to usual views all three venous symptoms were in communication. In the discussion it was pointed out that stereoscopic photograhs were necessary to avoid overlaying of vessels. (This apparently was not done).

Pyelographies in three cases of pyelonephritis of pregnancy. Levy-Solal, Misrachi and Salomon.

A case of utero-placental apoplexy, hysterectomy after blood transfusion. Devraigne Sugor and Hebert.

Sacro-coccygeal tumour, multiple malformations. Devraigne.

Umbilical hernia, multiple malformations. Devraigne and Hebert.

*Two cases of craniotomy for depressed fractures of the skull in neonates. Brindeau and Petrignani.

"Craniotomy" is used in its surgical, not its obstetrical sense. Both infants recovered.

*Placental tumour; acute hydramnios, atypical lesions of the foetal liver. Brault.

In the hope of allowing the pregnancy to continue the liquor amnii was tapped through the abdominal wall. Two litres were drawn off. Rapid re-accumulation took place and the uterus had enlarged practically to full size in 24 hours. Labour came on spontaneously the following day. The placental tumour was a simple angioma the size of an ostrich's egg. The liver was much enlarged and infiltrated by embryonal (small

round?) cells diffusely and in foci, some of the lower cells were enlarged and multinuclear. In spite of a negative Wasserman and the absence of the treponema pallidum when examined by Levaditi's method, syphilis is suggested as a probable cause.

Painful calcified fibroid in the pouch of Douglas. Mircea.

SOC. D'OBSTET. ET DE GYN. BORDEAUX.

Cancer of the ovaries and pelvic peritonitis. F. Papin.

Parovarian cyst and abortion; difficulty of diagnosis, particularly from extra-uterine pregnancy. Charbonnel and Favreau.

Exophthalmic goitre and pregnancy. Andérodias.

Three cases of intra-uterine pregnancy simulating ectopic gestation. Balard.

A case of uterine inversion. Péry.

Pregnancy developing in the uterine cornu. Guyot and Mailhe.

Intractable vomiting of pregnancy treated by chloral and milk enemata. Péry and Mailhe.

REUNION OBSTET. ET GYN. DE NANCY.

Old-standing haematocele. Hamant.

Severe disturbances of pregnancy in the absence of a living ovum. Lévy.

Bilateral mammary hypertrophy, partial excision of breasts. Delfourd, Vermelin and Riff.

Concerning prolonged gestation. H. Vermelin.

A pregnancy one month overdue as calculated from the last menstruation in a woman cohabiting with her husband. The foetus weighed 4,200 grammes after craniotomy and died suddenly and inexplicably during the early stage of labour before rupture of the membranes.

Concerning rapid delivery of the placenta in breech labours. Job.

SOC.D'OBSTET. ET DE GYN. DE STRASBOURG.

Congenital malformation in a neonate.. Ectopic vesicæ, split pelvis. Reeb.

Pregnancy after bilateral salpingectomy. Burger.

Concerning metrorrhagia in women after the menopause. Keller.

Fibroid and appendage infection. Deschamps.

SOC. BELGE DE GYN. ET D'OBSTET.

Concerning the induction of labour for pyelo-nephritis (pyelitis) of pregnancy. Schockaert.

Low transperitoneal Caesarean section. Weymeersch and Wodon.

BULLETIN DE LA SOS. D'OBSTET. ET DE GYN. DE PARIS &c.
No. 8. 1926.

Concerning two cases of temporary eventration of the uterus after Caesarean section. Laffont, Houel, Duboucher and Jahier.

Concerning a case of dystocia due to a praevial fibroid. Laffont.

Tubo-interstitial pregnancy of approximately two weeks gestation; progressive peritoneal inundation. Laffont, Houël and Jahier.

*Malformation of the small intestine. Laffont and Jahier.

Very little clinical or anatomical detail is given in a very brief account. After 21 cm. of duodenum and jejeunum there is a length of three cm. impermeable and the remainder of the intestine has the thickness of a

"crayon" and a minute canal. The author concludes that it is "truly a lesion of congenital syphilitic origin because the infant is the issue of a uniovular twin pregnancy and the Wassermann has been positive in the mother's blood." The state of the other twin is not mentioned, as the subject of the communication was born alive, operated on the next day and survived operation 40 hours, it is to be supposed that the other twin was healthy.

SOC. D'OBSTET. ET DE GYN. DE BORDEAUX

Therapeutic abortion in a tuberculous patient. Anderodias and Lescarret.

Abortion induced for tuberculosis complicated by non-ulcerated laryngeal tuberculosis. Boursier and Farges.

Both the above were induced at about three months in cases where the general condition was distinctly aggravated by the pregnancy. Both went rapidly downhill, one dying five months, the other two months after intervention.

Concerning a case of uterine rupture. Pedy.

Maternal small intestine protruding from the vulva was mistaken for fœtal and cut off by the practitioner who then vainly attempted to turn the infant. He then called in further assistance. Owing to transport and other difficulties nothing could be done except to inject morphia. Pery remarks that the "doctor in attendance is evidently not an accoucheur though otherwise perfectly honourable and conscientious."

Evolution of young fibroids in a uterus already the site of a calcified fibroid. Jeanneney.

On a case of tuberculous appendage. Guyot and Princeteau.

Congenital ascites. Favreau.

*Total cancer of the vagina removed by vulvo-colpo-hysterectomy. Charbonnel.

The cancer apparently began in the usual site had spread right round the vagina and down to the vulva. Death soon after operation.

*Intervention for bilateral pyosalpinges with fistulæ into the rectum, bladder and on the skin. Guyot, Princeteau and Mailhe.

A case of rare uterine malformation. Péry.

In Ombredanne and Marten's classification this case comes in group V. There was a bilocular body with a medium septum and a single cervix. There was a double vagina. The first pregnancy ended at seven months and destroyed the vaginal septum; the second went to term and a live female was born. The diagnosis was made finally after the first pregnancy but was not clinched by intra-uterine exploration

Appendicitis in the puerperium; death from appendicular "black vomit." Pery and Princeteau.

Double pyosalpinx followed early by pregnancy. M. Rivière.

Bilateral epitheliomatous tumours of the ovaries with ascites. Begouin and Massé.

REUNION OBSTET. ET GYN. DE MONTPELLIER.

Large ovarian tumour, 17.2 kilos. De Rouville, Madou and Villa.

Described histologically as an œdematus fibro-myxo-sarcoma. Recovery from the operation; the after-history is not stated.

On the nature of pseudo-iso-agglutination and its importance in studies of obstetric serology. Pelissier and Falgairolleo.

Anomaly of the sternum in a neonate. Vallois and Vialletou.

On the duration of the development of ovarian cysts. Tédenat.

Auto-graft or homo-graft. De Rouville and Madon.

Premature induction for the second time in a woman previously subjected to Cæsarean section. Vallios.

REUNION OBSTET. ET. GYN. DE NANCY.

On a case of hereditary harelip. Lévy.

Slow dilatation subsequent to the use of Filhos caustic. Vermelin.

Ovarian fibroma. Delfourd and Lucien.

Cystic cervical lymphangioma. Job.

Aseptic retention of a placental cotyledon. Vermelin.

Large hydrosalpinx. Delfourd and Lucien.

Pregnancy complicated by fibroid, infection, abortion, hysterectomy. Delfourd.

Interruption in pregnancy in a case of pyelitis. Fruhlinsholz.

SOC. D'OBSTET. ET GYN. DE STRASBOURG.

Ovarian abscess with sub-acute evolution simulating a pregnancy. Descamps.

*Ovarian pregnancy of 44 years standing. Litho-Kelypho-pædion. Sittles. It is rather difficult to decide from the brief description whether the pedicle of the tumour, described as corresponding with the ovarian ligament, was an artefact in the course of a difficult operation necessitating removal, inter alia, of 10 to 12 cm. of small intestine.

Intestinal obtruction caused by a large calcified fibroid. E. Weber.

Severe cardiopathies (pregnancy toxæmia) in the first half of pregnancy. Kreis.

SOC. D'OBSTET. ET DE GYN. DE TOULOUSE.

Chorea gravidæ. Laurentie.

The French Maternite at Beyrouth. Laurentie.

Intractable vomiting and renal insufficiency. Andebert and Daléas.

Certain failure of transfusion in weakly or premature neo-nates. Daléas. Galy-Gasparrou.

*Ruture of the uterine scar at the beginning of the third labour in a woman who had had two Cæsarean sections. Andebert and Fournier.

The uterine scar was found thinned at the second operation; there is evidence of a stormy convalescence, retention of lochia and intra-uterine douching; some suppuration in the abdominal scar at the sixth month of the third pregnancy.

The onset of labour pains was shortly followed by severe pain and considerable local tenderness of the uterus. Operation three hours after the onset of labour, revealed numerous adhesions, some free blood and an opening of the upper part of the old scar through which the placenta was visible. A living infant was obtained. Subtotal hysterectomy was performed.

Marken vaginal atresia of obstetrical origin; subsequent pregnancies; later development of complete genital prolapse. Laurentie.

*Some reflections on the pathogenesis of rickets. Laurentie.
The rarity of rickets supports the thesis of the importance of sunlight in the prevention of rickets.
Genital syphilis. Laurentie and Topous-Khay.
Two gummata, the one on the anterior uterine wall, the other on the right tube, together with the ordinary salpingo-oöphoritis. The nature of the gummata was determined histologically. W. R. strongly positive.
Sixteen observations of single, median anterior incisions of the vaginal portion of the cervix during labour. Andebert and Galy-Gasparrou.
On appendiculo-ovarian lesons. Dieulafé.
Purulent salpingitis opening freely into the pelvic cavity. Baillat and Morel.
*Two cases of absolute shortness of cord. Rascol.
Cords of 30 and 33 cm.

R. H. Hendry.

Archiv für Gynäkoygie.

Vol. cxxix, No. 1, *June* 19th, 1926.

*Does hæmophilia occur in the female? K. H. Bauer and E. Wehefritz.
Hypnotic twilight sleep in obstetrics with special reference to its technique. Günther v. Wolff.
Internal secretion, basal metabolism and protein metabolism during pregnancy. E. Klaften.
*Late hæmorrhages after labour and abortion. O. Frankl.
Exophytic adenomyosis of the uterus and tubes. J. Schiffmann.
Comparative studies of maternal and fœtal blood. K. Von. Oettingen.
Birth mechanism in contracted pelvis. P. Schumacher.
*Further observations on "Röntgen children." P. Werner.
The influence of intramuscular injections of milk on acute inflammatory processes and on the co-existent general and local cyto-reactions. W. Butomo.
Post-coxitic pelvic narrowing. R. Benda.
Double malformations of the female genital organs. A. Ecke.

Does hæmophilia occur in the female?

A reply to a criticism by Siemens of recently published works by the authors and by K. H. Bauer. They disagree with Siemens, who holds that there is insufficient evidence to give a definite answer to the question "Does hæmophilia occur in the female?" Taking into account the lack of authentic reports of hæmophilia in the female, the increased possibilities for transmission of hæmophilia in conditions of modern civilization, the carefully recorded family trees in bleeders, and the absence of female hæmophiliacs in these same families they conclude that in the present state of knowledge it is legitimate to deny that hæmophilia occurs in the female. They adhere to Bauer's view of the biological significance of hæmophilia.

Late hæmorrhages after labour and abortion.

The purpose of this paper is to show that hæmorrhage occurring late (seven days and upwards) after childbirth or abortion is frequently due not to partial retention of the placenta but to partial subinvolution of the decidua in which degenerated but still large blood vessels may bleed. The writer accepts the classification of Kermaunar—according to whom these

bleedings are due to (1) placental remnants, (2) general infections, (3) small aneurysms, (4) deficient involution of the decidua and its blood vessels—and emphasizes the importance of the fourth group. In seventeen years at the Peham Klinik there were 460 cases in which the uterus had to be curetted, cleared out digitally or extirpated for severe hæmorrhage from seven days to (in general) six weeks after labour or abortion. In 155 instances the presence of chorionic villi in the uterus was excluded by microscopic examination. Cases in which hysterectomy was done numbered 23 : after exclusion of those in which chorionic elements were detected, or in which the bleeding could be attributed to co-existent morbid pelvic condition, such as myoma or ovarian cyst, there remained six instances in which thorough examination of the excised uterus failed to show abnormal conditions other than decidual subinvolution. (Signs of inflammation which were present in about one half of the cases were regarded as unconnected with the bleeding). Hyaline degeneration was a prominent microscopical feature. There was no instance(in the whole series) of late hæmorrhage after delivery between the fifth month and term.

Further observations on "Röntgen" children.

Werner refers to 22 patients in whom conception followed some time after X-ray or radium applications to the ovaries, whereby transitory amenorrhœa (three cases) or diminution of menorrhagia was induced. These patients had 45 pregnancies of which 27 led to live birth and 21 terminated prematurely. Of the 27 children, five died early in infancy, one suffered from congenital heart disease, one from congenital tracheal stenosis, one from congenital deformity of the leg, one became rachitic, one died from pulmonary tuberculosis, several were weakly and several showed some retardation in mental development. Two thirds of the children were of less than average length and weight, and an unusually high proportion (two thirds) were girls. Animal experiments have shown in offspring conceived after irradiation of the mother, diminished weight and fertility, and increased mortality rate; congenital defects in the lower limbs and eyes have been reported in the second but not the first generation. Previous observers have reported similar findings to Werner's in children conceived after irradiation of the mother—including also anæmia, disorders of gait, encephalocele and Mongolism. Possible harmful effects on the second generation should also be born in mind. It is concluded that whenever possible "ovarian castration" in young women should be avoided : irradiation of the pituitary, thyroid, liver and or spleen is a useful and less dangerous substitute. Regarding the fate of the fœtus when abdominal radiation has been done during pregnancy (usually in an error of diagnosis) various authors have reported mental deficiency, microcephalism, defective skeletal development, ocular defects and Mongolism. Werner reports an additional case of the last named condition.

W. E. Crowther.

Monatsschrift für Gebürtshülfe und Gynäkologie.

Vol. lxxiv. No. 1–2. *July*, 1926.

*The etiology and pathogenesis of eclampsia and the toxæmias of pregnancy. A. Dienst.

*The influence of fluid changes in the blood in pregnancy on the red cell picture. G. H. Schneider.
*Extirpation of ovarian tumours in pregnancy. B. v. Váró.
*Rupture of the uterus. F. A. Scheffzek.
*Hypophyseal amenorrhœa. E. Klaften.
*Human antibodies in blood and milk. K. Heim.
*The constancy of agglutination of blood groups. C. Barsky.
Tumours in a cervical stump. J. Koener.
*The use of phychic methods of treatment in gynæcology. B. Barsky.
*Sterilisation and induction of labour from the legal point of view. Bähr.

The etiology and pathogenesis of eclampsia and toxæmias of pregnancy.

Dienst's theory appears to him trebly satisfactory, in that it is founded on actual experimental results, it explains all clinical manifestations, and derives the pathological anatomy and clinical findings from a single source. This source is the abnormally increased thrombin, which depends on atypical leucocytosis and a failing circulation in the organs which produce antithrombin (*i.e.* the liver, placenta, and thyroid). Thus the œdema of pregnancy, hyperemesis, albuminuria, the "pregnancy kidney," and eclampsia all differ from normal pregnancy in this increased thrombin content, which in turn produces spasm of vessels, *via* the parenchyma, and later also *via* the vegetative nervous system. A secondary increase in fibrinogen depends on pulmonary damage, and has a prognostic value.

The influence of fluid changes in the blood in pregnancy on the red cell picture.

Schneider concludes that in pregnancy the changes in the usual balance between the substances in ionic, molecular and colloidal solution in the blood at first cause a hydræmia, and later a true plethora. The characteristic polycythæmia of pregnancy runs parallel with the increased cholecharacteristic high colour index shows increased activity on the part of the blood-forming organs. Failure in these blood changes, even to a slight degree, such as causes no clinical signs, produces a hæmolytic condition in pregnancy which may progress to what Schneider calls hæmatopathia gravidarum.

Extirpation of ovarian tumours in pregnancy.

v. Váró has had good results in removing ovarian tumours by laparotomy in pregnant women; he gives novatropine and papaverin for four to five days after operation, a method which has reduced his cases of abortion to 10 per cent. He concludes that operation is essential and believes it to be less likely to cause abortion if not undertaken at the time of the suppressed menstrual periods.

Rupture of the uterus.

Scheffzets concludes that all uteri, in which even the possibility of an old scar exists, should be explored after delivery of a placenta, since in one case a fatal tear after an old Cæsarean section and a difficult labour occurred with no signs till the puerperium. He deprecates all vaginal manipulations after occurrence of rupture and emphasises the necessity for immediate laparotomy.

Hypophyseal amenorrhœa.

Klaften finds the differentiation of a hypophyseal type of amenorrhœa or oligomenorrhœa is supported both by clinical observations and investigation of metabolism. In cases where the ovary is put out of action by operation or X-rays, the basal metabolic rate is lowered, though hardly any change occurs in the value of the specific dynamic protein action. In the majority of primarily hypophyseal cases, on the other hand, a normal basal metabolic rate is accompanied by lowered specific dynamic protein values. Finally, he reports the metabolic findings (both values diminished) in case of pituitary tumour with amenorrhœa.

Human antibodies in blood and milk.

Using agglutination as a test of the immunity reactions between father, mother and child, Heim confirms that the groups and their relative proportions in the newborn correspond to the adult conditions. Genealogically the rule is found to be that the antigens A and B (in the blood cells) were dominant, while the agglutinins (a and b) were recessive.

Systematic determination of the blood groups is helpful in investigation of the occurrence of monovular twins. Heterospecificity has no bearing in pregnancy on eclampsia, nor in transplantation on the survival or function of the transplanted organ. Human skim milk shows the same reactions at the patient's blood serum. Colostrum and milk at the end of lactation give no clear picture. Tissue fluid gives agglutinations probably of a different type. Cerebrospinal fluid gives no agglutination. Starlinger's work suggesting differences between plasma and serum requires further investigation.

The constancy of agglutination of blood groups.

After summarising the literature on the subject and reporting some investigations of his own, Barsky concludes that the groupings according to agglutination of blood remain constant, and that the error of those who believe that variations occur after quinine, anæsthesia, menstruation etc., lay in their use of the microscopic method, which led to confusion with rouleaux formation.

The use of psychic methods of treatment in gynæcology.

Liegner has used hypnosis in a large number of cases, including dysmenorrhœa, leucorrhœa, constipation, dyspareunia and labour, with good results, but considers the method only suitable for selected cases and specially by selected practitioners. This applies even more strictly to psycho-analysis.

Sterilization and induction of labour from the legal point of view.

At present sterilization can only be performed legally in Germany in the patient's interest and with her consent; social reasons are not legally valid. Inductions are also permissible on medical grounds in cases where the mother is in danger and consents to the treatment. Laws giving more freedom to the medical profession in these matters are under consideration.

Dorothy N. L. Leverkus.

Zeitschrift für Geburtshülfe und Gynäkologie.

Vol. lxxxix. No. 3. *February*, 1926.

*The morphological cell-structure of the endometrium. E. Terruhn.
Dyspareunia in pregnant women. J. S. Galant.
*The glycogen content of the vaginal epithelium, its diagnostic and therapeutic importance. E. Schwab.
The birth of quaduplets studied from a new case. E. Häfeli.
*The biological relationship between lutein cell tumours and chorion-epithelioma malignum. K. Herold.
Blood transfusion in gynæcology. H. Schultheiss.
Ichthyosis congenita. F. Heinrichsbauer.
The cases of placenta prævia in the Maternity Hospital of Karlsruhe in the years 1893—1923. H. Wagner.
The etiology of rupture of the uterus studied from the pathological-anatomical point of view. H. Kurtz.
Ten years experience of cases of eclampsia. U. Westphal.
Ovarian struma. T. Manasse.
*Primary abdominal pregnancy. L. Schoenholz.

The morphological cell-structure of the endometrium.

The author summarises observations on a series of 150 specimens obtained from curettings and freshly removed uteri. In his study, the epithelium presents no difficulties. The uterine glands form a secretion which is rich in glycogen, and gives a positive reaction with mucicarmine stain. In addition to the mucus-like material, the secretion has a small lipoid content.

The author compares the structure of the stroma tissue to that of the spleen. There is first of all, a definite scaffolding of dense fibrous tissue, which forms layers under the surface epithelium and round the glands and blood vessels. In addition to this, there is a fine stroma recticulum, the cells of which are rich in glycogen and fat, especially during the pre-menstrual phase, and some of which give a positive oxydase reaction. These cells were shown by experiments on guinea-pigs to have the power of picking up intravitam stains. They differ from the reticular endothelium of the spleen, in that they have no definite phagocytic properties. Throughout of the stroma there are also found leukocytes, plasma cells and lymphocytes, which rise from local lymphatic structures deep in the endometrium.

The glycogen content of the vaginal epithelium, its diagnostic and therapeutic importance.

Having reviewed in a very critical spirit the various forms of lactic acid therapy used in the treatment of vaginal conditions, the author proceeds to describe the results of the histological examination of portions of vaginal mucus membrane removed from a series of 85 cases. From early childhood to the menopause, the vaginal epithelium has a rich glycogen content, which he believes to be the nutritive medium of the lactic-acid-forming bacteria of the vaginal canal. In the pre-menstrual phase and in pregnancy, the glycogen content of the individual cells is not increased, but the hyperæmia and lymph filtration through this tissue

increases the amount of carbohydrate introduced into the vagina. In elderly women, associated with atrophic changes of the epithelium, the glycogen tends to disappear. This is associated with a tendency to relaxation of the vaginal walls and the occurrence of prolapse. The absence of glycogen is probably associated with the diminished resistance to infective processes of the vaginal epithelium in such patients. In severe constitutional disturbances, such as chlorosis and general asthenia, the glycogen content is also diminished, and this is clinically associated with the occurrence of excessve leucorrhœal discharge.

Injuries to the vaginal epithelium produce local fibrosis, with localised absence of glycogen, but do not diminish the content on the rest of the surface. The author believes that failure to recognise this quality of the vaginal mucous membrane has been the cause of the non-success of the treatment of vaginal infections by the introduction of lactic acid or lactic acid bacilli.

The biological relationship between lutein cell tumours and chorionepithelioma malignum.

From the study of a case which occurred in the University Frauenklinik at Jena, the author discusses the relationship of chorion epithelioma to lutein cell tumours. The patient in this case had a large, hydatidiform mole removed from the uterus by vaginal hysterotomy. Three months later the patient was found to have a cystic tumour, about the size of an adult head, growing from the left adnexa. Laparotomy revealed this to be a large lutein cyst, which was immediately removed. The other ovary showed a lutein cell tumour and was also removed. A month later uterine bleeding led to an exploration of the uterine cavity, revealing the presence of a chorion epithelioma. The patient's condition was so poor that a radical operation was inadvisable, and even then there was already a metastasis in the broad ligament.. The patient was treated with X-rays, and not only did the uterus diminish in size but the metastasis disappeared. In view of the necrotic nature of the chorion epithelioma, the author wonders whether a spontaneous cure might not have occurred without the intervention of X-rays. He discusses the relationship between the two conditions as one of a hormone balance. Lutein tissue controls chorionic growth. Excess of the one produces a corresponding hypertrophy of the other. He believes that the removal of the lutein tumours in this case was leading to a necrosis and disintegration of the chorionepithelioma. The converse of this experience would explain why lutein tumours disappear after the removal of a hydatidiform mole.

J. Hendry

REPORTS OF SOCIETIES.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Annual Meeting in Manchester, January 15th, 1926.

The President, Mr. W. GOUGH, (Leeds), in the Chair. Present 19 members.

The Annual Statements of the General Secretary and Treasurer were read and adopted.

One new member was elected.

The office-bearers for 1926 were elected.

Dr. J. W. Burns (Liverpool), described a case of :—

CARCINOMA OF THE CERVIX AND PREGNANCY.

E. K. æt. 41 years. Children 3/5 no miscarriages. Youngest child five years. Menstruation 15, 4/28 type. No dysmenorrhœa, no leucorrhœa. Last menstrual period December 16th, 1924.

This patient came to hospital on March 20th, 1925, complaining of pain in the back and lower abdomen. She stated that for some time the menstrual periods had been irregular and that for the past six months there had been bleeding following coitus. More recently there had been a constant blood-stained discharge per vaginam.

On abdominal examination, the uterus was enlarged and bimanually the pregnant state was confirmed. The cervix was soft, and there was a ragged patch on the posterior lip which bled freely on touching.

On April 2nd, 1925. Under anæsthesia the cervical condition was further investigated, and a small portion removed for examination. This was later found to be malignant.

On April 9th, 1925. Total hysterectomy was performed. The operation was easily carried out on account of the softened condition of the tissues. No enlarged glands were found. The patient made a good recovery, and returned home within three weeks.

January 5th, 1926. Examination shows a small recurrence in the scar in the roof of the vagina, at nine months.

The specimen shows the uterus pregnant about sixteen weeks, opened through the posterior wall. The fœtus and its membranes can be seen in situ with the placenta on the anterior wall. A small area of the posterior lip of the cervix shows a dark discolouration, and a section of this shows microscopically the typical appearance of carcinoma.

Cancer of the cervix complicating pregnancy is a comparatively rare condition. Gross[1] found 120 cases in 224,080 cases of childbirth. This

means 1 in 1,867 or 0.053%. Sarvey[2] collected 53 cases in 84,148 cases of childbirth investigated. This is 1 in 1,600. De Lee[3] gives the incidence as 1 in 2,000.

In the reports of the St. Mary's Hospital, Manchester, for the years 1915 to 1923 inclusive, six cases are reported in 23,967 cases of childbirth, an incidence of 1 in 4,000. The Rotunda Hospital Reports for a period of twenty-five years, dealing with about 45,000 cases of childbirth, do not contain a single case. The reports of the Liverpool Maternity Hospital for the years 1916 to 1923 inclusive, and dealing with 16,680 cases of childbirth, are similarly negative.

These figures, together with the fact that I have only been able to collect about twenty-eight cases in British Literature, would suggest that the incidence for the British Isles is much less than that given by the above authorities.

Authorities are not agreed whether the malignant condition usually antedates the pregnancy or develops after conception has taken place. Gross[4] found in 16.7% of his cases that the cancer was present before the pregnancy. John T. Williams, John W. Williams, Keyes, Savey and Schweitzer[5] all agree that in the majority of cases the cancer is present before the pregnancy.

In the case reported above, there is some evidence to prove that the malignant condition of the cervix was present before conception could have taken place. The patient complained of bleeding following coitus for six months, and the pregnancy is only just four months by date.

As far as treatment is concerned, most authorities agree that if the malignant state is discovered before the fourth month, hysterectomy ought to be performed after full explanation to the patient and her relatives. After the fourth month, the pregnancy can be allowed to go to term, and Cæsarean section performed with or without hysterectomy.

References.

1. *Centralbl. f. Gynak.*, xlvi. 567.
2. Hirst. *New York State Journ. of Med.*, vol. 23. 1923.
3. De Lee. "Manual of Midwifery."
4. N. Schilling. *American Journ. of Obstet. and Gynæcol.*, vol. 7, 1924.
5. N. Schilling. *American Journ. of Obstet. and Gynæcol.* vol. 7, 1924.

The President said that he had seen two cases of malignant disease of the cervix complicating pregnancy. In both he had been struck by the softness of the growth and the absence of any craggy edge. In one case, which he observed through labour, the cervix dilated quite easily and delivery was normal. The case was treated by Wertheim's hysterectomy about three weeks later.

Drs. Donald (Manchester), Phillips (Sheffield), J. E. Gemmell and Miss Ivens (Liverpool), also joined in the discussion.

Dr. Burns briefly replied.

Miss Edgecombe (Liverpool), on behalf of Miss Ivens and herself reported a case of :—

Dicephalus Dibrachius Dipus Causing Obstructed Labour.

An example of this unusual type of monstrosity recently occurred in the Liverpool Maternity Hospital.

Mrs. A. E., aged twenty-four, primigravida, had been married three years. She had felt well during pregnancy, and had not consulted a doctor for antenatal examination. Labour started on September 22nd, 1925, at 5.30 a.m., a midwife being in attendance.

A breech presentation was diagnosed and labour continued until two days later, when the breech was delivered to the umbilicus. As there was no further progress the midwife summoned a doctor, who, with the assistance of a colleague, pulled down the arms under anæsthesia, but was unable to deliver the after-coming head, and sent the patient into hospital at 10.30 a.m., September 24th.

The uterus was almost tonically contracted, but a large sausage-shaped tumour was visible, having two rounded prominences above the brim of the pelvis, the higher prominence being situated in the left iliac fossa.

The uterus was contracted strongly, pains occurring every minute with incomplete relaxations between the contractions. The abdomen was acutely tender. There was some hæmorrhage from the lacerated and œdematous soft parts. The legs, body and arms of a small dead child protruded from the vulva, the back being in front.

The patient was anæsthetised, and the hæmorrhage was found to be coming from the vaginal tear extending high into the left fornix. A thickened band could be felt in the left side, feeling like an incompletely dilated rigid cervix, but this was not present on the right side, and was probably the stretched neck of the left head, while the right head was extended immediately above the brim. The child's body was rotated, so that its abdomen faced the mother's left thigh. Delivery was then effected by a combination of the Prague method with jaw traction and suprapubic pressure, the child's body being carried up over the mother's abdomen. The second or left head followed immediately, and it appeared probable that the rotation of the body had released the twist of one neck round that of the other, and so made delivery possible. Subsequently, a fracture of the first neck was found.

The single placenta was expelled spontaneously. After delivery the perinæum and vulva were found to be badly lacerated, portions of the levatores ani hanging loose on either side of the wound.

After a mercurial douche (1 in 2,000) the bruised tissues were cut away, and the lacerations were repaired with silkworm gut. Good union resulted.

Apart from slight pyrexia due to urinary infection (B. Coli), the puerperium was uneventful.

When seen two months after delivery, the patient stated that she had never felt better, and was beginning to perform her usual household duties. The perinæum had completely healed and micturition and defæcation were normal.

The Wassermann reaction was negative or indefinite on two occasions.

The specimen is one of a double-headed monster or Dicephalus Dibrachius Dipus—a female weighing 6lbs. 15ozs. There are two distinct heads, two arms, two legs, and a single body, which shows, however, on X-ray examination, two distinct spinal columns, approximating in the sacral region. The shoulders are broad, and there is a tag of skin in the supra-sternal region. The heads are flattened on the inner surfaces where the have been in contact.

Dissection by Mrs. Barton Hall.

There are single abdominal and thoracic cavities, with one sternum and two clavicles. There is a single heart and pericardium with one auricle and two ventricles, two aortae, two pulmonary arteries, two superior venae cavae and one inferior vena cava. The right aorta supplies the right head and upper limb only; the left aorta supplies the left head and upper limb, and continues as a normal thoracic and abdominal aorta.

There is a trachea from each head leading to four lungs in four pleural cavities. The organs developed from the brancial arches and clefts are duplicated (tongue, thymus, thyroid).

The ailmentary canal is duplicated as far down as the duodenum.

The right stomach opens into the first part of the duodenum; the left stomach into the second part of the duodenum. The spleen is single and in a normal position on the left side.

The liver is normal in position. An accessory lobulated portion continuous with the normal liver appears to have herniated through the diaphragm, and lies in the thoracic cavity posterior to the heart and pericardium.

There is a single gall bladder and bile duct, the pancreas being double.

Below the duodenum the alimentary canal is single. The kidneys, ureters, supra-renals and female pelvic organs are those of a single fœtus.

On deep dissection a complete fracture of the right neck was found, the spinal cord of that side having been dragged upwards, and lying in a loop at the site of fracture.

Comments.

As all double malformations develop from a single ovum, there was in this case a single placenta and single chorion.

In certain conditions Dicephali are capable of living. The best known example was Ritta Christina, born in Sardinia on March 13th, 1829. These twins of female sex had four upper and two lower limbs, (Dicephalus Tetrabrachius Dipus). The vertebral columns, separate above, were joined below by a rudimentary os innominatum, and there was also union of the two manubria. In this malformation union of the internal organs often occurs.

Mechanism of Labour.

In this case a pelvic presentation was favourable, as one head could pass after the other. It has been recommended to draw the trunk when expelled up over the abdomen of the mother, so as to bring the posterior head into the hollow of the sacrum, the second head then slips up anteriorly above the pelvic brim and remains behind.

Blacker[1] (1912) notes that of twelve cases of Dicephalus recorded in the Trans. of the Obstet. Soc. (seven in Playfair's paper (1867) and five after that date), in four the breech presented, and that when care was taken to cause the two heads to enter the pelvis one after the other they passed without difficulty.

In conclusion, I should like to thank Miss Ivens for her very kind help and co-operation in the preparation of this case.

Reference.

1. Birnbaum. "Malformations and Congenital Diseases of the Fœtus. Translated and annotated by Blacker, 1912.

The President thought that the comparative ease of delivery which looked impossible in the specimen as shown, was largely due to the broken neck of the second head, allowing greater stretching.

Professor Briggs (Liverpool) said how impressive the lesson was from this and similar specimens. The specimens are rare; with them and the delayed labour they cause, rupture of the uterus is extremely rare; the lesson the specimen lodges is strongly in favour of version which is so often turned down whether in prescription or in published work: it brings home the teaching of Potter's latest work, "Version in Obstetrics."

Mrs. Barton Hall (Liverpool), said that she was particularly interested in the specimen as she had had the privilege of dissecting it.

Going through the Literature on Dicephaly since 1866, when Playfair collected seven cases, she had found thirty-seven published cases from all parts of the world.

Studying the anatomy of these cases she found that they could be divided into three main groups dependant upon three stages in the superior dichotomy of the primitive streak.

The first group, which was rare, was the true Dicephalus Dibrachius Dipus, of which Miss Ivens' specimen was an example. The second and common group include those specimens which resemble the first group externally, but on dissection or X-ray examination are found to have a rudimentary third upper limb in the form of a fused scapula and clavicle. The third group was the true Dicephalus Tribrachius Tripus, and occurred with about the same frequency as the first group.

She thought that the lungs and œsophagi in these cases of Dicephaly were always reduplicated, and the extent of the reduplication in the rest of the thorax and abdomen depended entirely upon the level of separation.

With regard to the viability of these monsters, she thought that the greater the degree of separation, the more chance there was of the fœtus being viable, and quoted a case of Dicephalus Tribrachius Tripus delivered alive which lived twenty-four days, but died with convulsions.

Drs. Donald, Phillips and Miss Ivens took part in the discussion, and Miss Edgecombe replied.

Miss Edgecombe also communicated on behalf of Miss Ivens and Mr. R. W. Brookfield, a case of :—

Nægele Pelvis.

A case of this abnormality was admitted to the Rest Home of the Liverpool Maternity Hospital on 16th September, 1925, under Miss Ivens.

History. There had been two previous pregnancies, the first terminating in a difficult forceps delivery with a stillbirth, the second by an induction at the 38th week, the child being 5lbs. 15ozs., and surviving.

The patient was twenty-three, of medium stature and in good general health. There was no lameness, but an inspection of the pelvis showed a slight obliquity from the right, downwards towards the left. The right anterior superior spine and the left posterior superior spine were more prominent than their fellows. The labial cleft also deviated slightly downwards to the left.

On vaginal examination the right ilio-pectineal line was felt to be straight, reducing considerably the capacity of this side of the pelvis. The right ischial spine also formed a very marked projection into the

pelvic cavity. The symphysis pubis was markedly deviated to the left side. The left side of the pelvis felt approximately normal.

The measurements of the pelvis were as follows :— I. S. 8½ ins. I. C. 10 ins. E. C. 8¾ ins.

The distance from the right posterior superior spine to the left anterior superior spine was 8.2 ins., and that from the left posterior superior spine to the right anterior superior spine was 7.5 ins., showing a difference, therefore, of about three quarters of an inch.

The D. C. was 3.9 ins., and the transverse of the outlet 3 ins. (approx.).

On her admission to the Rest Home, at about the 38th week, the patient had a purulent vaginal discharge, coming mainly from the cervix, and also two vagina cysts. Vigorous local treatment was adopted, but the induction was felt to be contra-indicated on this occasion, and pregnancy was allowed to proceed to term. Cæsarean section was performed by Miss Ivens on 26th September, a female child weighing 8 lbs. 4 ozs. being delivered from the L. O. A. position.

A prophylactic dose of 10 c.c. antistreptococcal serum was given to the mother, and she made an interrupted recovery, being discharged on the fourteenth day after the operation.

Ætiology. Enquiries were made as to any history of deformity or dystocia in the family. All the immediate relatives had had normal deliveries and healthy families. There was no history of the patient having been lame or suffering from any serious illness during infancy or adolescence.

The only conclusion seems to be that the deformity was due to a defect in development of the right ala of the sacrum.

The obliquely contracted pelvis of Nægele was observed first in 1802. In 1839 he published a monograph on thirty-five specimens, one a mummy.

It is a developmental defect due to absence of one lateral mass of the sacrum, and bony union of the sacrum with the ilium is usually present. The bones are otherwise healthy. There is compensatory scoliosis of the lumbar portion of the vertebral column with its convexity on the diseased side. The obliquity is caused by the unequal pressure of the body weight and upward thrust of the femora on each side. On the defective side the femur is nearer the middle line than on the sound side, so that the pressure is upward rather than outwards. On the sound side the acetabulum is further outwards than usual, the wing of the ilium looks more forward and less inwards than usual, and the symphysis pubis is pushed over to the sound side.

On the defective side, in consequence of the more directly upward pressure, the ilium between the acetabulum and synchondrosis is compressed and thickened, and the ischial tuberosity and spine are displaced inwards, upwards and backwards.

All specimens described are exactly alike, and there is no sign of bone disease. The defective development of the sacrum is the essential condition, although it has been suggested that the synostosis results from destructive inflammatory charges, but cases have been described where synostosis is not present.

Frequency. In 1861 Thomas recorded fifty cases, but the entire number is only about one hundred.

Effect upon Labour. To end naturally the head must be small, and must enter the pelvis with the occiput towards the obturator foramen on

the sound side. In labours reported only a quarter of the children have survived. Litzmann stated that in pre-antiseptic days twenty-two out of twenty-eight mothers died in the first labour.

Pinard[2] in one case performed ischiopubiotomy on the diseased side, but was criticised by Budin on the ground that ankylosis at one sacro iliac joint might prevent expansion of the pelvis.

REFERENCES.

1. Naegele. "Das schragverengte Becken. Maine, 1839.
2. Pinard. "De l'ischio pubiotomie ou operation de Farabeuf. Annales de gyn. et d'obstet. 1893. xxxix. 139. 143.

Professor Briggs referred to the case.

Professor Briggs then showed two specimens :—

Specimen I. Uterus, (Wt. 1lb. 3½ozs.), with multiple fibroids mainly of its lower uterine segment : one fibroid, the largest, also intra-ligamentary on the left side low down, was fixed upon the pelvic floor. Vaginal hysterectomy, 2nd October, 1925.

Mrs. L. : aged 48; 4 children, 4 abortions; 9 years a widow; anæmic from blood-losses; complaining of pressure symptoms.

Specimen II. Enlarged Uterus, (Wt. 4ozs.). I—II degrees of prolapse on weak pelvic floor; glandular erosion of the cervix; a sessile adenoma, also an interstitial fibroid, of the body of the uterus. Vaginal hysterectomy, 23rd September, 1925.

Mrs. B. : aged 44; in robust health with a family of 3, the youngest 12 years; complained of mucopurulent discharge and irregular blood-losses, also pressure symptoms.

Professor Briggs then read :—

A RELATIVE NOTE ON THE ADVANTAGES OF VAGINAL HYSTERECTOMY.

The specimens were obtained, within a period of ten days, four months ago. In the meantime, during the waiting period for insertion upon the Society's Agenda of this meeting, their tissue resiliency and elasticity have been sacrificed by the formalin preservation.

Compared with the size of the normal pelvic cavity where each originally lay at a low site, the one specimen is large, (19½ozs.), and the other is small, (4ozs.).

Are there any advantages in a vaginal hysterectomy in the treatment of these uterine non-maligant new growths?

This is a question not to be unduly pushed.

Dr. Johnson stated that "questioning is not the mode of conversation among gentlemen," and Sir Walter Raleigh in "Laughter from a Cloud," wrote, "Dr. Johnson left Oxford without a degree," also as further thoughts on examinations, "the brilliant man who did not know, and the learned man who did not think, met in the Second Class and disliked each other. The poet sat in the Third, and laughed."

I am cheerfully content with the success and safety of vaginal hysterectomy, where the site and size of uterine innocent growths point towards the pelvic floor.

The pelvic floor is a continuation of the abdominal wall; each has its claims.

Not infrequently, during vaginal hysterectomy, the laxity of the pelvic floor aids the operator, and at the close in compensation there is the operator's opportunity for its correction. This addition was made to the vaginal hysterectomy for the smaller tumours, (Specimen II); the temperature was raised during the first five days after operation; otherwise a normal convalescence and repair were recorded.

So far, in the lighter phase, (Specimen II), vaginal hysterectomy is bright in prospect and easy in performance.

In the heavier phase, vaginal hysterectomy is fairly and fully represented by Specimen I, in size equal to filling the outlet of the pelvis, and to sticking there pending the reduction in the bulk, and the alteration in the shape of the accessible uterus illustrated in Specimen I.

Morcellement or enucleation, or other equivalent method of removal of some of the constituents of the group of fibroids converts an impassable ovoid or sphere into a flexible yielding column of the collapsed and partially cut-walls of the uterus, enveloping the remainder, if any, of the fibroids.

The preservation of the pelvic floor is watchfully observed.

Most of us require more often to be reminded than to be informed. Morcellement, we realise, is conducted within, and on tissues which are to be removed, and not to be retained at the patient's risk, a normal convalescence recorded after vaginal hysterectomy is not an exceptional expectation.

"Lest we forget," are three moving words inspiring human thought and action.

After Pean's introduction in the eighties of the last century, the part played by morcellement by its excess early trespassed on the grounds of abdominal hysterectomy. The overlapping has not been one-sided.

In January, 1898, on the ample evidence of the day that vaginal hysterectomy for fibroids was a sound operation, I published a report of thirteen cases, and confirmed the value of morcellement at a time when the French total figures made all elsewhere absurdly insignificant.

The English Translation by Eastman and Giles, 1897, of "The History and Technique of the Vaginal Radical Operation," which was based on Freund's publication, 1878, and Pean's Morcellement, by Prof. Dr. Leopold Landau and Dr. Thedor Landau; it preceded "The Technique of Vaginal Operations," by E. Wertheim and Th. Micholitsch, with 138 illustrations, published in Leipzig in 1906. The latter work, at the invitation of the Committee, I reviewed for the *Journal of Obstetrics and Gynæcology of the British Empire*, 1906, p. 188.

Both these works were designed to go beyond or outside the scope of vaginal hysterectomy; they increased an ill-chosen competition of vaginal section with abdominal section, hence the need for concentration.

The representative article by Dr. Herbert Spencer, on vaginal hysterectomy in the treatment of uterine fibroids in Allbutt, Playfair and Eden's "System of Gynæcology," 1906, remains to-day for guidance.

The attributes of vaginal hysterectomy are consistent with the higher interests of gynæcological surgery.

The President said that in his earlier days he had done vaginal hysterectomy for fibroids, some of which reached the umbilicus. Of recent years, however, he had used the abdominal route for such tumours, as being

easier and the work being done by sight. He thought, however, that vaginal hysterectomy had a very useful place in the treatment of the bleeding uterus about the menopause, as it was associated with much less shock than the abdominal operation. He found that the convalescence was often rather delayed by discharge of pus and small sloughs from the vagina.

Dr. Donald said that at one time he had removed uterine fibroids by vaginal hysterectomy on a good many occasions, and in some of the cases the upper level of the tumour was as high as the umbilicus. It was an interesting experience, and he thought that even in the present time a gynæcologist should be familar with the technique. But now the operation of vaginal hysterectomy should be limited to cases of chronic metritis or hypertrophy in women approaching the menopause, with fairly patulous vaginæ. In these cases there was still a place for it. The convalescence was generally a smooth one, and free from some of the discomforts that often followed the most successful abdominal operation for fibroids.

Mr. Phillips and Dr. J. E. Gemmell also spoke and Prof. Briggs replied.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held in Sheffield, February 19th, 1926.

The President, Mr. W. GOUGH (Leeds), in the Chair. Present 13 members. Two new members were elected.

The President showed a specimen of Carcinoma of the Cervix in a patient aged twenty-nine years.

Dr. Dougal (Manchester) had analysed the ages of fifty odd cases, and remarked on the variation in the age of patients with carcinoma.

Professor W. Fletcher Shaw (Manchester) stated that the youngest patient he had seen with this condition was aged twenty-two years.

Professor J. S. C. Douglas and Mr. W. W. King (Sheffield), demonstrated a specimen of Mucocele of the Appendix.

Dr. Dougal (Manchester), said he had operated on two similar cases, but each had been a case of pseudo-myxoma originating in the ovary.

Dr. Dougal (Manchester), showed a specimen of Double Placenta from a case of Placenta Prævia.

The patient, a primigravida, thirty years of age, had a severe attack of ante-partum hæmorrhage at the 34th week, and was admitted to Hospital.

On admission, the hæmorrhage had ceased, and there was no dilation. The fœtal heart sounds could be heard perfectly well; the head was presenting, but high up, and there was a distinct resistance felt in the lower uterine segment, which was thought at the time to be due to a placenta prævia, or possibly to concealed hæmorrhage. There was no further bleeding, and the patient was kept at rest for three weeks. At the end of that time she had slight pains, and the membranes ruptured.

Vaginal examination showed the cervix to be very little, if any, dilated. A few hours later the cord prolapsed, and an anæsthetic was given, and

attempts made to replace it. During these attempts, which proved unsuccessful, there was profuse hæmorrhage, and the pulsations in the cord ceased. The child being dead, and no further bleeding taking place, the patient was allowed to deliver herself, and this she did about ten hours later.

The specimens which I show are the placenta, membranes and cord. The placenta is double, but the two halves approximate to one another at their distal extremities. Both lobes reach the edge of the opening in the membranes. The insertion of the cord is at the inferior margin of one lobe, the vessels to the other lobe covering an intervening area of membrane. One lobe is supplied by the main trunks of the umbilical arteries and vein, but the other lobe obtains its supply from a subsidiary branch of one artery and vein. The vein to this lobe runs along the edge of the opening in the membranes, and would be very liable to pressure or actual injury during delivery or intra-uterine manipulations. I think it very possible that something of this sort happened during attempts to replace the cord.

With the number of anatomical abnormalities present in this case, viz. placenta prævia, marginal and velamentous insertion of cord, and exposed vein on edge of opening in membranes, the chances for the child were evidently very poor indeed. The combination of placenta prævia and low insertion of the cord not only favoured prolapse of that structure, but also made replacement difficult, if not impossible.

The following cases were recounted :—

The President. Adenomyoma of the Uterus.

Mr. King (Sheffield), said the case brought up the question as to whether removal of the ovaries in these cases was sufficient treatment.

Professor W. Fletcher Shaw (Manchester), considered removal of the ovaries alone was sufficient in the majority of cases.

Mr. A. Leyland Robinson (Liverpool).

An Ovarian Cyst in a Girl Eleven Years of Age.

The specimen was removed from a healthy well-developed girl of eleven years, who had complained of abdominal discomfort for one week. Her doctor discovered a tumour which formed a marked prominence in the lower abdomen, extending up to the umbilicus. It had all the physical signs of a simple serous cyst, and the diagnosis presented no difficulty. A vaginal examination, which was made under anæsthesia immediately before operation, disclosed a typical dermoid consistency of the lower pole of the swelling, and suggested the dual pathological nature of the tumour. Removal was easy, and convalescence uneventful. It was noticed at the operation that whilst the conformation of the external genitalia was normal, the uterus was noticeably narrow and elongated, the probable result of pressure from the tumour, and perhaps of hypo-function of the ovary.

The specimen proved to be a bilocular cyst, the lower loculus showing the usual characters of a dermoid, and the upper one, those of a serous cyst adenoma.

These cases are not very uncommon in children under ten years of age,

for Bland Sutton collected one hundred cases, and Howard Kelly published one hundred and twenty-six cases in 1901, of which fifty-five were unilocular or multilocular cyst adenomata; forty-seven were dermoids and twenty-four solid tumours of the ovary.

Many tumours have been successfully removed from quite young infants —Darcy Power operated on a child of four months, and MacGilliray in 1908 described a very interesting operation at which he had successfully removed a cyst completely filling the abdomen of an infant of eleven months.

So far as I am aware, the last time the subject was discussed in this Society was in 1910, when, in Liverpool on February 18th, that is sixteen years ago yesterday, Mr. Cuff showed a dermoid removed from a child of nine years.

During the discussion Dr. Lloyd Roberts related three cases, all dermoids. Dr. Babagliati two, also dermoids, and Professor Donald one case of a solid tumour, said to be a sarcoma, although the patient was free from recurrence for three or four years after operation.

The chief points of interest in the present case are:—

1. Although the tumour was of a fair size there was almost a complete absence of symptoms which are generally those of an acute abdomen, and due to torsion.

2. The association of a dermoid cyst with a serous adenoma, and

3. The attenuated appearance of the uterus, and the possibility of persistent infantilism as a result of the loss of the left ovary, which would appear to offer an excellent opportunity for the use of glandular extracts during pubescence.

It occurred to me that it would be interesting to know how many cases of this type the Fellows and Members of the Society have seen during this interval of sixteen years, and also appropiate that as a Sheffield Member described the last case at a Liverpool Meeting—a Liverpool Member should repay the compliment in Sheffield.

Two Solid Tumours of the Vulva.

The two cases of tumours of the vulva were operated upon within a short time of each other, and both were sent to the hospital with a diagnosis of Bartholin's Cyst, but proved to be solid tumours of an uncommon type.

Fibro-Myoma of the vulva—this was removed from a single multiparous woman of thirty-three years, who complained of a lump in the privates, which had been present for five or six years. On examination, a hard, smooth discrete and freely mobile tumour was found beneath the skin of the right labium majus with the nymphae stretched over its median surface. The position of the lump closely resembled that of a Bartholin's gland. There was nothing pertinent in the past history of the patient, and in particular, no evidence of gonorrhœal infection. The lump was excised without difficulty, and as its chief point of attachment was at the upper or inguinal pole, it is probable that the tumour arose from the terminal vulval fibres of the round ligament.

Microscopically, it is clearly a fibro-myoma, and would be called a desmoid by some pathologists. The latter are described as connective tissue tumours of the female abdominal wall, which display active growth during pregnancy, and have a pathological relationship to the fibro-sarcomata.

The probability is that dermoids are merely fibro-myomata, arising in the round ligaments, or some outlying or displaced rest of myometrial tissue, which grow in unison with the uterine muscle during pregnancy, and that the cellular appearance produced by this decidual or pregnancy reaction has been mistaken for malignancy, and led to the incorrect inclusion of these tumours amongst the sarcomata.

The second case is one of Carcinoma of Bartholin's Gland, which was removed from a widow of fifty-five years of age seventeen years past menopapse, There was no history of gonorrhœa or any serious illness. There had been four abortions the last twenty years ago, and no full time labours. The patient complained of some dragging pain in the vagina and of a lump in the vulva, which was first noticed four months before seeking advice, and had been getting bigger lately.

A swelling the size of a hazel nut was found in the right Labium majus, in the anatomical position of Bartholin's gland. It is slightly tender and solid in consistence. The overlying skin was perfectly normal in appearance and mobility. No glands could be felt in either groin. Local excision only was carried out, partly because the patient's general condition was very poor, and partly because the diagnosis of malignancy rested on suspicion alone. There were no enlarged glands, and it was thought that this type of malignant disease being very rare, the lump might turn out to be a simple adenoma.

A small secondary hæmorrhage occurred on the ninth day of convalescence, but otherwise the patient made a smooth recovery, and remains well at the present day, seven months later, during which time she has been under treatment by X-ray therapy.

Dr. Herbert Spencer in 1913 published a similar case, and included in his paper thirteen which he had collected from the literature, of which only one had been published in English Journals. The published records of this condition are, therefore, extremely rare, and I believe this case to be the first reported to this Society.

Spencer states that these tumours are harder than an inflamed gland, and nodular on the surface, and associated with bluish discolouration of the skin and œdema of the hymen, but fourteen cases are too few to dogmatise on, and practically none of these points were seen in my case.

Of the fourteen examples collected by Spencer, in one only was there any positive history of gonorrhœa, and in only three was leucorrhœal discharge a feature, so that previous infection has little, if any, aetiological significance. Congenital abnormality was noticed in two cases; Bartholin's gland being apparently absent on the opposite side of the tumour. The pathological appearances vary greatly, and little agreement exists amongst the fourteen authors. In three cases the growth is described as "Carcinoma" only; in two as "Cylindrical Carcinoma," "Tubular Carcinoma, partly Scirrhus," "Carcinoma parvi Cellulaire," "Cancroise Carcinoma," "Adeno Carcinoma," "Villous Carcinoma," "Squamous-celled Carcinoma" and "Adeno Carcinoma, resembling Squamous."

Spencer points out that these pathological differences are associated with the fact that the epithelium lying around the acini and ducts varies considerably in shape and arrangement, and hence the gland may well give rise to tumours of diverse appearances. He quotes Jambon and Chaboux, who examined the gland of several young adults after death.

They state—"that the excretory ducts appear in the middle of the gland in the form of irregular cavities, reaching even to the middle of the acini. They present an epithelium either of one or several layers of cubical cells. Generally as the duct increases in calibre and importance its epithelial lining becomes thicker. The cells are only half the size of the secretory cells of the acini, and consist of a large nucleus surrounded by a thin layer of granular protoplasm; near the termination of the common duct the superficial layers of the lining epithelium tend to become squamous.

These authors say nothing about distinctly cylindrical epithelium in the duct, though this is mentioned by de Sinety, Klein and Langerhans.

In the present case there can be no doubt that the tumour is an Adeno Carcinoma resembling squamous.

These growths are said to be of great malignancy, and of the fourteen cases mentioned by Spencer, only one, Trotta's was alive and well for so long as six years after operation. It was interesting to note that no glands were removed in this case, as in my own, whose progress I hope to report to the Society at some later date.

Dr. Dougal (Manchester).

CHRONIC INVERSION OF THE UTERUS.

Mrs. H., married, aged twenty-four, consulted me in October last year. She complained of constant bleeding which commenced six weeks after her confinement, fourteen months previously.

At the confinement the child was born without interference, but the placenta was retained, and had to be removed manually. She states that she was much shocked at the end of the labour, and her convalescence was slow.

When I saw her, the patient was extremely anæmic. On vaginal examination, a soft swelling was felt protruding through the cervix, and there was a fair amount of bleeding on handling this tumour. The fundus of the uterus could not be felt in its normal position, so a diagnosis was made of chronic inversion, and the patient admitted to hospital for treatment. I decided to try to reduce the displacement with a Repositor, and as Dr. King had recently shown a modified form of this instrument before the Society, I wrote to him, and he very kindly sent it for me to use. I found it impossible, however, to replace the uterus with this instrument, and a further attempt with Aveling's Repositor was equally unsuccessful. I therefore decided to replace the uterus by surgical means. On November 5th, I performed Spinelli's operation. This is really an extensive anterior hysterotomy, but I found it somewhat awkward to carry out owing to the inverted structures. I had to incise the anterior wall of the uterus as high as the fundus before it was possible to reduce the displacement. There were no adhesions present at the neck of the sac, but the peritoneal surfaces about the fundus were adherent to one another, and on separating these I found the remains of a partially atrophied fibroid, about the size of a bean. I excised this tumour, and then stitched up the uterus. There was a good deal of oozing which I was unable to control completely, so I was compelled to leave a narrow gauze drain in contact with the anterior uterine wall. The vaginal wall was then sutured in the usual way, a small part being left open for the gauze to pass through.

The patient made an uneventful recovery, and is now, three months later,

menstruating regularly and losing a normal amount of blood at these times.

There are one or two interesting points about the case. I think the inversion may have been caused by extracting a partially separated placenta, but, on the other hand, it may have been spontaneous, the fibroid tumour at the fundus of the uterus playing some part in the process. The failure to replace the uterus with the Repositor was no doubt partly due to the fact that the anterior and posterior surfaces of the uterus were adherent in the neighbourhood of the fundus.

Dr. C. P. Brentnall (Manchester).

RUPTURED UTERUS.

The case I have to report is that of a women aged thirty-eight years, her sixth pregnancy. The first four labours were normal and at full term, the fifth was premature, and the child was still-born.

There was a minor degree of pelvic contraction. The transverse measurements being normal, and the conjugate being slightly reduced. The external conjugate measured less than seven inches.

There were no abnormalities during pregnancy, and labour began about the estimated date.

Pains began at 8.0 in the morning, and continued all day until about 5.30. They do not appear to have been severe as the woman did not summon the midwife until the afternoon. There was a prolonged interval between the pains at the time, and the woman was still going about the house when her husband returned from work at 5.30.

The membranes ruptured shortly after this, the uterine contractions recommenced, and she took to her bed. She says that she bled a good deal during the evening, but this is doubtful, as the midwife did not send for a doctor until about midnight.

The pains continued without intermission until half-past two in the morning. She was seen by two doctors about midnight, and was immediately sent off to hospital with the diagnosis of impacted breech. There appears to have been no attempt at any operation.

She arrived at hospital at 2.30 in the morning. Labour had then lasted 18½ hours, and the membranes had been ruptured nine hours. She was very pale and shocked. Abdominal examination revealed the obvious fact that the uterus was ruptured. The body of the fœtus could be felt to one side, and the contracted uterus to the other. The lower abdomen was very tender, and she complained of pain in the left shoulder.

The fœtal head was quite low down in the pelvis, lying in the transverse diameter, and there was a depressed fracture of the posterior parietal bone. Dr. Hunter delivered the fœtus by craniotomy, and removed the placenta manually. I had considerable doubt whether the woman would stand an abdominal section, but it appeared her only chance.

On opening the abdomen I found a longitudinal tear of the uterus extending from about the attachment of the round ligament, and involving also the upper part of the vagina. Both layers of the broad ligament were torn across, but the Fallopian tube and infundibulo-pelvic ligament were intact. The uterus was removed as rapidly as possible by panhysterectomy, and the vaginal wound closed. The pelvis was drained by a rubber tube in the lower angle of the incision.

There are one or two unusual features about the case. Ruptures of the uterus are, of course, of more frequent occurrence in the minor than in the major degrees of contracted pelvis, and they are commoner in multiparæ than in primigravidæ. But in such cases there is generally a history of dystocia, and the supposition is that some undetected injury to the soft parts gives way at the subsequent labour. In this case the pelvic contraction is of very minor degree, the pelvis being of the simple flat variety. And all the previous confinements had been completed without difficulty or undue delay.

There was no early rupture of the membranes, and if we assume that the second stage of labour began when the waters broke, its total duration was not more than nine hours.

The most unusual feature of the case appears to me to be that the head had passed the brim, and was well down in the pelvis.

Professor W. Fletcher Shaw (Manchester), read a note on two cases of Wertheim's hysterectomy complicated by double ureter, of which a full report appears in this Journal. Vol. 33, No. 2, page 285.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held in Liverpool on March 19th, 1926

The President, Mr. W. Gough, (Leeds), in the Chair.

Present 23 members and 2 visitors.

Dr. J. E Gemmell (Liverpool), showed a specimen of carcinoma corporis uteri.

The patient was sixty-two years of age, with a history of the menopause at fifty-six, and removal of a simple cervical polyp at fifty-nine, followed by blood-stained discharge at intervals, and for the last nine months losing freely at intervals, and always has some pain.

Per vaginam, the uterus was felt to be enlarged and fixed.

Preliminary curettage confirmed the fixed uterus, and the microscopic character of the scrapings was definitely carcinomatous.

Pan-hysterectomy and removal of both appendages was done. The appendages were fixed in the pelvis and fixed the uterus by adhesions which were simple inflamatory in character, without any sign of secondary carcinoma to be found.

The uterus contained a well-marked carcinoma in the fundus, and an absence of growth in the cervix.

The patient made an uneventful recovery.

The microscopic section of the growth is that of carcinoma.

Mr. A. Leyland Robinson showed a specimen of sessile fibroid polyp causing inversion.

The following cases were recounted :—

Miss Ruth Nicholson (Liverpool). Three cases of carcinoma of the

cervix occurring in women under treatment for syphilis and gonorrhœa.

During the seven years I have had charge of two clinics for venereal disease among some 1500 patients, these three cases of carcinoma of the cervix have occurred.

Arthur Helme reported in 1902, a case in a woman of twenty-three, a nullipara—one year married, associated with double pyo-salpinx, where the husband was known to have suffered from gonorrhœa and syphilis.

Gordon Luker described in the proceedings of the Royal Society of Medicine for 1922, a case of squamous-celled carcinoma of the cervix in a young 2-papra aged twenty-eight, under treatment for gonorrhœa in the London Hospital Veneral Dept. He remarked that no other case of a similar nature had arisen during the seven years the clinic had been in existence, emphasising the fact that the local treatment may have acted as an irritant.

Herbert Spencer in his Lettsonian lectures delivered before the Medical Society of London in 1920, says that he thinks that the relation of syphilis, soft sores and gonorrhœa to cancer of the cervix is a close one, and that he has twice seen carcinoma of the cervix develop in patients who had previously had chancre of the cervix.

As these are the only cases and references I have found recorded, the following notes of the three cases may be of interest :—

Case 1. A single woman aged twenty-five, known to be a prostitute—no pregnancies. I first saw her in 1919, when she was being treated for syphilis. Unfortunately, there were no notes relating to her condition on admission to the home. She was also suffering from a chronic urethritis and endocervicitis, and though at the time, gonococci could not be demonstrated in the discharge, later she developed salpingitis, (as can be seen from the speciman); gonococci were then found in vaginal smears. The treatment for syphilis was continued, and local applications of protargol and glycerine were used for the cervix for five months.

She appeared a year later, that is in 1921, with a recurrence of vaginal discharge. There were no signs or symptoms of carcinoma. Two and a half years later, in December 1923, she complained of intermenstrual hæmorrhage of one year's duration, and on examination, the condition shown in the specimen was felt. She was transferred to the Stanley Hospital where Miss Ivens performed hysterectomy. The pathological report is "a squamous-celled carcinoma." She is still alive, two and a quarter years later, but the malignancy has recurred.

Case 2. A woman aged forty, married for twenty years, five pregnancies, all full time living children. Forceps delivery, first labour—others normal—youngest child eight years old. The patient was first seen in 1921, with well-marked signs of secondary syphilis and a doubly-positive Wassermann—no primary chancre was seen. There were no signs of gonorrhœa, and smears from the cervix and vagina were negative. She had gone to Germany five months previously to join her husband, who was with the Army of Occupation, and had apparently been infected there. She was treated for syphilis, and has had a negative Wassermann and no clinical signs for two and a half years. In February, 1924, three and a half years after infection, and two months after her last visit to the clinic,

she returned complaining of slight frequency of micturition. Vaginal examination revealed an irregular growth of the cervix, which bled readily. She was admitted to hospital, and I operated a few days later. The specimen shows a warty growth arising in the cervical canal, and the microscopical section shows a luxuriant papillomatous growth originating from the columnar epithelium, which does not invade the stroma of the cervix, and therefore might be considered benign. The cells, however, are multi-layered, actively proliferating, and irregular in shape. These facts, in conjunction with the microscopical appearances, are in favour of malignancy. The closed adherent tubes show that a gonorrhœal infection was also present, and a year afterwards, on resuming marital relations, she developed acute urethritis and vaginitis, gonococci being demonstrated in smears from both orifices. She is at present, two years after operation, alive and well, and apparently free from recurrence.

Case 3. A woman aged fifty, married twenty-nine years—one full-time living child twenty-eight years ago—and no further pregnancies. She was sent to the Venereal Dept. in June 1925, by Dr. Rinn of Bootle, suffering from tertiary syphilitic ulcers of the thighs. The Wassermann reaction was doubly-positive. Urethritis, vaginitis and endocervicitis were also discovered, and gonococci were found in the urethral and cervical smears. A vaginal examination elicited that sub-total hysterectomy had been performed (four years previously, by Dr. Burns).

This patient had intra-venous injections of neo-kharsivan and local treatment for the gonorrheal infections for two and a half months. She stopped attending the clinic in September of last year, and re-appeared four months later, in February of this year. She stated that she had been suffering from neuritis of the left arm, and had not felt well enough to come. She had noticed no discharge or hæmorrhage. On inserting the speculum to examine the cervix, I saw a small cauliflowerlike mass which bled readily. She returned to Dr. Burns for removal of the cervix. The microscopical section (which he has kindly lent me) shows a "squamous-celled carcinoma."

In each of these cases the presence of the gonorrhœal infection with its accompanying cervical discharge, may have been a predisposing factor in the production of cancer. In cases 1 and 3, local treatment may have caused further irritation. It is, of course, a possibility that the primary chancre occurred upon the cervix in these cases, as it was not seen anywhere else.

The youth and nulliparity of case 1 are unusual with carcinoma, and so make it more probable that venereal infection may have been a factor in this patient.

I should like to know whether members have had similar cases, and if they consider there is any connection between venereal infection and carcinoma.

Dr. H. Leith Murray (Liverpool). A case of hydatid cyst of the cervix uteri.

Hydatid cysts of the internal gentalia appear to be very rare. Some, if not most of the cases recorded, are undoubtedly a direct extension of the uterus, fallopian tubes, or ovaries of an adjacent hydatid tumour.

The case of hydatid cyst in the substance of the cervix now recorded is

of interest by reason of its unusual situation, and in its history of a retro-peritoneal hydatid cyst removed from the region between the right kidney and the liver, eleven years and eight months previously.

The patient, Mrs. .B, was thirty-two years of age, married for thirteen years, but without family. She had spent the whole of her life in Connah's Quay, on the estuary of the river Dee, and had never been even one night away from home. She did not keep dogs, and had no particular liking for uncooked vegetables.

Menstruation was regular at twenty-eight day intervals, and with a duration of three to four days. The quantity was moderate, but clots were occasionally present. Her symptom, when seen in November, 1925, consisted of pain radiating from the left of the umbilicus across the right side to the back. She said that this pain had troubled her for, at least, ten years, and that for the last few years she had felt when walking that there was a "big lump," in the pelvis. She stated that the pain was less severe now than previously, but that the feeling of weight and fulness in the pevis was becoming more prominent.

Her previous history of hydatid cyst is as follows. She was admitted to the Hospital for Women, Liverpool, on January 6th, 1914, under Dr. Briggs, who has favoured me with the following extract from a letter written about that time :— "On January 9th, her abdomen was full of ascitic fluid of an opaque shreddy kind, which was tested by inoculation of a guinea pig, and found not to be tubercular. The explanation came later, after her return home, when a retro-peritoneal cyst formed between the right kidney and the liver : this I opened from the right loin on March 4th, after her re-admission to hospital. The urine was normal, so we hoped there was no serious disease in the kidney : the cyst was then found to be hydatid, and whenever a hydatid cyst has burst into the peritoneum, in my experience, the daughter cysts have grown all over the abdomen. It never occurred to me that the "ascitic" fluid might be due to the leakage of a hydatid cyst. The experience has been quite unique : the cure is assured." Dr. Briggs also reports that the uterus, tubes and ovaries were then normal.

Examination of the abdomen in November, 1925, showed a large swelling, the size of a sixteen weeks pregnancy, extending rather more to the left side than the right. The swelling was dull to percussion, and felt solid and rather fixed. Vaginal examination showed the lower pole of this tumour depressing the vault of the vagina, and rotating the os upwards and forwards so that it lay quite beyond reach behind and above the syphysis pubis. There was a doubtfully cystic area posteriorly, but the main mass of the tumour felt as solid as at abdominal examination. A provisional diagnosis of hydatid cyst in the pelvis was made.

As there appeared no possibility of reasonable access from below, abdominal operation was carried out on November 11th. It was, at once, obvious that the swelling was wholly in the cervix. Kelly's method of approach, by bi-section of the small uterine body lying on top of the swelling, was adopted, and after the abdomen had been throughly packed, an incision into the cervix was made. A cystic swelling with a thick capsule was at once exposed and opened. It was judged to be rather larger than a full time fœtal head. Very numerous daughter cysts, varying in size from

a hen's egg downwards, escaped, and, with difficulty, the cyst wall was then shelled out from the surrounding cervix. After a troublesome dissection, mainly by finger pressure, I succeeded in removing the whole of the capsule in a single piece. There was no sign of any other cyst in the pelvis, abdomen or kidney regions. It would have been impossible to remove the remaining shell of cervix, and the cavity, therefore, was reduced by sutures and a sub-total hysterectomy, with removal of both appendages carried out.

There can be no doubt that the cyst lay wholly within the substance of the cervix, for a definite and intact capsule of cervix was visible at the end of enucleation. Its situation appeared to be in the posterior wall, but the cervical canal was not seen. There was no peritoneal adhesions.

The patient made an uninterrupted recovery. When seen ina routine way on March 15th, 1926, she complained of some discomfort in the pelvis, and on examination a little thickening, apparently in the recto-vaginal space, was felt; this appears to be inflammatory.

Giles[1] recorded the first genuine case of primary hydatid tumour of the uterus occurring in this country. The cyst was the size of a fœtal head, and lay in the substance of the anterior uterine wall. He was able to record very few cases from foreign literature. De Vries,[2] who recorded a case in 1904, found, at the time only seven genuine cases in literature. Tittell[3] records a uterus the size of an eight months' pregnancy with ovaries, each the size of a child's head; all three organs contained an enormous quantity of cysts and hooklets, without evidence of hydatid cyst elsewhere.

The present case cannot be compared with those just quoted, except in its suggestion of infection of the uterus through the blood stream.

REFERENCES.

1. Proc. Royal Soc. Med. (Obst. and Gyn. April 6th, 1911).
2. Quoted in discussion of Giles' paper.
3. Arch. für Gynäk. Bd. 82, 1907, page 180.

Dr. H. Leith Murray. A case of carcimoma of the cervix of a prolapsed uterus.

Carcinoma of the cervix of a prolapsed uterus appears to be surprisingly infrequent. The case now recorded is the only one I have had under my own care, and is only the second I have seen.

Mrs. M., aged forty-three, gave a history of moderate, and not very troublesome prolapse for some years. She had had four children the last eight years previously. She had been under treatment for pulmonary tuberculosis for two years, and was considered to be holding her own; she had not recently lost weight. Her cough, however, was troublesome, and to this was attributed an aggravation of the prolapse, which had occurred during a few weeks previous to my seeing her. During those weeks, there became apparent for the first time, she stated, a protrusion at the vulva, which bled readily and almost continuously, and was associated with considerable pain in the pelvis and a tendency to retention of urine. She asserted that menstruation had been regular, but scanty, until two months previously; since that time there had been a good deal of blood-stained discharge, with latterly an objectionable odour.

Examination showed the patient to be thin, but not wasted. At the vulva there was a protrusion about $2\frac{3}{4}$ inches long of sloughing, infected, friable carcinoma; it bled readily to the touch, and appeared to be freely movable.

In view of her tuberculosis and the grossly infected condition of the cervix, it was considered best to recommend a quick amputation of the cervix, followed by radium. On October 20, 1924, I amputated the cervix. The bladder was separated with some difficulty, but was not invaded by the growth; the difficulty due to cellulitis resulting from secondary infection of the growth. During the operation the peritoneum was accidentally opened, and a vaginal hysferectomy was substituted for the original intention.

The patient made a good recovery from the operation, and underwent prophylactic radium treatment. There was a recurrence of vaginal bleeding, but, as I did not have an opportunity of examining the patient after the operatioin, I am unable to state whether recurrence at the growth developed. She died twenty-one months later, apparently from the lung condition.

Sections of the deepest part of the growth show intense infection of a very active squamous carcinoma of rather unusual type. Clumps of cells lie in pseudo-acini, and have, in places, a margin that might be described as "palisade." There is, however, no further resemblance to rodent ulcer, and the type of cell is very different from that found in this disease.

It is of interest to note that the only case of carcinoma of a prolapsed uterus recorded in the "Journal of Obstetrics and Gynæcology of the British Empire," 1910, vol. 17, page 234, Russell Andrews, gave a similarly short history of protrusion, although the length of the uterus in that case made it certain that there had been a visible prolapse for a considerable time. In the present case the specimen clearly shows that the cervix lay beyond the vulva, and that the protrusion was not merely a proliferative "cauliflower" carcinoma.

Dr. J. W. A. Hunter. A case of acute post-partum œdema of the cervix. Published elsewhere in this journal.

Dr. Arthur A. Gemmell, (Liverpool). Congenital absence of the vagina.

The following case of atresia of the vagina is brought forward because of the rarity of the condition in association with full development of the uterus and appendages.

The patient, M. D. aged eighteen, has never menstruated, but has had periodic attacks of abdominal pain for the past fourteen months. The attacks last a fortnight and occur at monthly intervals. The pain is felt in the sacral and hypogastric regions; it is so severe that it causes vomiting, but is relieved by hot applications of "brandy." The attack in which the patient was seen had lasted two weeks.

On examination, she is a poorly developed girl for her age. There are six digits on the right hand and each foot. The secondary sex characteristics are well developed. There is a mass in the abdomen extending from the symphysis pubis to the umbilicus, and the upper part of this felt like the body of the uterus. The external genitals are normal, but what was at first taken to be a vaginal orifice with a hymen, proved to be a patulous

urethral orifice situated in a more posterior position than normal; there was no vagina. Examination, P. R., confirmed that there was no vagina, and showed that the lower pole of the mass was cystic and extended to within about 2½ inches of the perineum.

It was considered wiser to attempt to reach the retained menstrual fluid from below, and after it had drained away, determine exactly what parts of the sexual apparatus were present, and then decide on a final course. Accordingly, a transverse incision was made in the perineum below the urethral orifice, but anterior to the fourchette. Blunt dissection was cautiously carried out through moderately firm tissue, the direction being guided by keeping a sound in the urethra and a large dilator in the rectum. Finally, the lower pole of the mass was reached and opened, and menstrual fluid escaped; at this point it was noted that pus escaped from the urethra. A tube was passed along the track formed by dissection, and stitched to the vulva.

The patient had been having rises of temperature before the operation, A dilator was passed along the track daily, and menstrual fluid escaped with pus on one or two occasions.

Five weeks later discharge from the track had ceased; there was still an abdominal swelling half way up to the umbilicus, but nothing suggestive of a uterine body, and the whole mass was fixed. During this time there had been no menstruation and no attack of pain.

On opening the abdomen, the bowels and omentum were found adherent to the abdominal wall and to one another, evidently shutting off the retained blood. These were separated with considerable difficulty, and during the process about an ounce of pus escaped from a pocket in the region of the right appendage. By further dissection the appendages were freed, the right from its normal position, and the left from the bottom of the pouch of Douglas.

The tubes were distended with blood, and the left open at its fimbrial end. The uterus was enlarged, soft and retroverted, and below ended abruptly in a firm boss embedded in soft connective tissue. Hysterectomy was carried out, but in attempting to enucleate what was thought to be the lower pole of the cervix from its bed, it was accidentally cut through, and as the patient was very shocked, and all secreting tissue had been removed, no time was lost in dissecting out the remaining cup. Peritonisation was carried out in the usual way, but with some difficulty.

The dissection from the perineum was found to have opened into the pouch of Douglas, and this was kept open as a drain.

On examining the specimen it was found that there was a small cap of vagina attached to the uterus.

The patient had a somewhat stormy convalescence. Fairly large quantities of pus were discharged from time to time from the perineal sinus which was irrigated regularly, but there was peritonitis.

On examination to-day, almost four weeks after the abdominal aperation, the perineal tract is healed and there is a little thickening on the right side of the pelvis. She is well and free from pain.

Absence of the vagina associated with hæmatometra, with or without hæmatosalpinges, is a rare condition, and I have only been able to trace

fourteen case in literature, four of which are reported by members of this society; the commoner condition being complete absence of the genital tract or its presence in such rudimentary form as to preclude menstruation.

In seven of these cases hysterectomy was performed immediately; five had an artificial vagina formed, as some part of the vagina persisted; and on post-operative complication is mentioned in any of these twelve. In the remaining two cases, perineal drainage was resorted to; one patient died, and the other recovered with suppuration.

A paper was read by Dr. G. W. Theobald on the toxæmias of pregnancy, with special reference to hyperemesis.

Dr. G. W. Theobald reported several cases of toxæmia associated with pregnancy, presenting unusual features. Four of these cases suffered from severe hypermesis gravidarum, two died, one delivered herself of triplets at about the 16th week of pregnancy, while the fourth improved after induction of labour.

He then considered the subject of hypermesis gravidarum both from the theoretical and practical point of view. He claimed that every physiological process was for the immediate good of the body, whereas pregnancy with the eroding action of the trophoblast—the extreme hypertrophy of the uterus—the presence of syncytium in the blood stream, and its many concomitants which were not to the good of the body, could hardly fall within the limits of the physiological. It seemed to him unfair that the vomiting of pregnancy should be considered as a nervous phenomenon, and claimed that although the vast majority of cases, especially in the early months of pregnancy, could be cured by suitable treatment, yet the underlying cause of all vomiting was the toxin circulating in the pregnant woman's blood.

There is apparently no chemical test which is of any value in discriminating between the various cases. From the point of view of treatment, a great difference exists between those cases of excessive vomiting occurring before, and those occurring after the 28th week of pregnancy. In the latter group excessive vomiting is usually only one of several manifestations of a toxæmia.

The burden of his paper was that menstruation, pregnancy and labour are normal and natural, but not physiological, and they represent a sacrifice on the part of the woman for the good of the race.

Pregnancy lowers the threshold of vomiting, and home worries, constipation etc. are the actual straws which precipitate the attack, which in itself sets up a vicious circle, both mentally and physically.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

Meeting held in Manchester on April 16th, 1926.

The President, Mr. W. Gough (Leeds), in the Chair.

Present 21 members and one visitor. One new member was elected.

Dr. D. Dougal (Manchester), described a case of Carcinoma of the Cervix Uteri after sub-total hysterectomy. The original operation had been one of great difficulty in the removal of very adherent double hydro-salpinges,

and a total hysterectomy then would have greatly increased the risks to the patient. He did not propose to discuss the relative merits of total and subtotal hysterectomy, as he considered that it would have been the proper course to have removed the cervix in the present case, had the difficulties not been so great. The growth in the cervix arose two years after the operation, and the cervix was then removed without difficulty.

Professors Blair Bell (Liverpool), and Fletcher Shaw (Manchester), agreed with Dr. Dougal as to the necessity of total hysterectomy in parous women, and when the cervix had been damaged or infected.

Professor W. E. Fothergill (Manchester), read notes on two cases of Hydatid cysts in the broad ligament.

Mrs. F., aged thirty-seven, no pregnancy. Menstruation began at fourteen and was regular, seven to eight days duration, and painful. When she was seventeen, the cervix was dilated with tents by the late Sir J. W. Sinclair; when she was twenty-two, Mr. J. W. Smith removed an abdominal cyst. In 1915, when she was aged twenty-six, there was a firm rounded swelling in the right side of the pelvis. Dr. Fothergill opened the abdomen and found several small hydatid cysts beside the one felt on bimanual examination. In 1918, Mr. J. W. Smith again operated, and removed a hydatid cyst from the liver. From 1922 to 1924, the patient suffered constantly and intensely from dymenorrhœa, menorrhagia and severe intermenstrual pain. There was a firm mass to the right of the uterus, which grew to the size of an orange. Finally, Dr. Fothergill operated again, and found many adhesions; both tubes were closed and distended; the uterus was hardened and enlarged, and the mass on the right was a fibroid in the broad ligament. Supra-vaginal hysterectomy with removal of the appendages was done in 1924, and the patient has since remained well.

Mrs. P., aged twenty-six married three years, no pregnancy. Menstruation began at thirteen, and is regular, but for the last three years its duration has been only two days instead of three. The complaint was violent abdominal pain of frequent occurrence and of some years duration. The patient dates the onset from a fall six years ago.

Bimanual examination revealed a firm mass on the right side. It was the size of a large fist, and was lobed in shape. The diagnosis was two or more small fibroids in the broad ligament. At the operation, adhesions were separated, and the right tube was found enlarged, closed and stretched over the mass of hydatid cysts. The tube was removed with the cysts, both ovaries, the uterus and the left tube being retained.

Dr. Croft (Leeds), said he had a similar case where there were also hydatids at the lower pole of the left kidney.

Dr. J. W. Bride (Manchester), described obstructed labour in a case of Uterus Didelphys, an account of which appears in this journal, vol. 33, No: 3, 1926, p. 446.

The President remembered a similar case, where spontaneous delivery of a breech took place, confusion as to the degree of dilatation of the cervix occurring, owing to examination of the wrong half of the vagina.

Professor Briggs (Liverpool), emphasised the fact that the non-pregnant horn was never drawn up out of the pelvis, and that obstruction to delivery was almost certain to occur in every such case.

Professor Blair Bell said the term didelphys was wrong. It was reasonably certain that the condition never obtained in women, and the correct nomenclature was bicornis.

Dr. Willett (Liverpool), described a case, showing that the non-pregnant horn does not obstruct.

Dr. Dougal then read a note on "Endometrioma of the Ovary—one ovary and both tubes having been removed ten years previously," illustrated by lantern slides and microscopical sections, and fully reported in this journal, vol. 33, No. 3, 1926, p. 439.

He considered that the ovarian condition now found was by direct extension from the uterus.

Dr. K. V. Bailey (Manchester), doubted if direct extension from the uterus ever took place. He thought the endrometrial tissue was already implanted on this ovary before the tubes were removed.

Professor Fothergill read a paper on "Hæmatomata in the abdominal wall simulating new growths."

Hæmatomata in the lower part of the abdominal wall sometimes present such close resemblances to tumours of pelvic origin that very nice diagnostic problems may arise. Cuthbertson[1] has recently collected forty-one cases in women of which no fewer than twelve were diagnosed as ovarian cysts and ectopic gestation. In only three of the forty-one cases was the hæmatoma recognised before operation, while in two others it was suspected. Thus the recognition of this condition is clearly a matter of some difficulty, and one which has points of special interest for those who deal with the diseases of women. This is illustrated by a recent case.

A lady, aged 57, was quite well until she had a day of severe abdominal pain. She sent for Dr. Bennett of Hyde, who found a considerable swelling above the pubes on the right side. The pain subsided under treatment; but, two days later, diffuse black bruises appeared upon the surface of the lower abdomen. When I saw her during the folllowing week there was a discoloured area, measuring about eight inches by four, containing many patches of subcutaneous hæmorrhage. There was a rounded swelling above the pubes, mainly to the right of the mid-line. It resembled a four and a half months pregnant uterus in shape and size, but was more like a fibroid in consistence. The cervix was pushed forward by a cystic swelling, which could be felt in the pouch of Douglas. Thus the physical signs suggested the presence of a fibroid above and an ovarian cyst below. But when the patient was asked to sit up, and so brought the recti into contraction, the swelling above the pubes could still be felt, and it became quite fixed. This showed that it was in the abdominal wall. The sudden onset of pain accompanied by the appearance of the lump and followed by the extravasation of blood under the skin indicated that rupture of some fibres of the right rectus had occurred. The diagnosis, therefore, was hæmatoma of the abdominal wall, together with ovarian cyst in the pouch of Douglas.

The abdomen was opened through blood-stained tissues to the left of the swelling, the linea alba being displaced towards that side. A simple cyst of the left ovary was then removed. The uterus and the right tube and ovary were normal. The appendix was removed, as it was involved with a portion of omentum, which was adherent near the abodminal ring.

The hæmatoma lay within the right rectus, with a thick layer of muscle over it. The mass of blood clot projected into the abdominal cavity, with a thin layer of muscle and the peritoneum under it. The clot was turned out through a cut in the edge of the muscle. The wound was then closed in the usual way, a strip of gauze being left in the cavity of the hæmatoma for one day. Healing occurred quickly.

I once saw a case in which someone had diagnosed ovarian tumour in the absence of the patient's usual medical adviser, Dr. Robertson, then of Rawtenstall.

The patient was a stout, healthy woman, past the menopause, and she told us that the pain and swelling dated from a fall over a clothes- basket, which hurt her very much, but did not prevent here from finishing her washing. The right lower abdomen was quite dull and solid, as if the right iliac fossa was filled by a mass which rose above the umbilicus and crossed the middle line. The mass could still be felt, and became fixed when the patient sat up, and this sign, with the history of the fall, gave the diagnosis of hæmatoma. Expectant treatment was employed.

Later there was some constitutional disturbance, and the mass became softer. When I saw the patient again the physical signs were those of a large cyst adherent to the abdominal wall, and it was clear that the blood-clot had become infected and liquefied. An incision through the right rectus liberated a great quantity of chocolate-coloured pus mixed with blood-clot which had been distending a cavity walled in front by the rectus and separated from the abdominal cavity by peritoneum below and by peritoneum and the sheath of the rectus above.

I subsequently saw a similar case, and, in the light of previous experience, recognised it as an infected and liquefied hæmatoma, and arranged for the patient's admission to hospital. When she came in, the lapse of time had introduced a new and disconcerting feature which rather shook the diagnosis, for the swelling, previously cystic, was now tympanitic. I remember the horror of some of those present when I incised this resonant area, and their relief when a blast of foul gas was followed by a gush of chocolate-pudding pus.

I once watched an operation after a very sporting diagnosis had been made—namely, myoma of the round ligament. The outcome was that the surgeon struck pus before he had cut through the abdominal wall. No doubt, when he examined the patient the mass felt solid and closely resembled a fibroid. Infection and liquefaction must have occurred in the time that elapsed between the making of the diagnosis and the operation.

Infection does not always occur. Dr. J. W. Stenhouse had a patient, a healthy elderly lady, with a firm fixed swelling above Poupart's ligament which appeared suddenly with pain. We concluded that this was a hæmatoma, and it disappeared entirely in the course of a few weeks. When I was house-surgeon to the late Sir A. R. Simpson two students brought their old landlady to see him in the Buchanan ward of the Edinburgh Royal Infirmary. She thought she had strained herself while leaning out to clean a window. There was lateral solid mass which seemed to rise out of the left iliac fossa and to be attached to the iliac bone. Simpson did not consider it suitable for operative treatment. He told us to strap her well up with strips of belladonna plaster. This gave

much comfort, and after a time she came back saying the plaster was too loose. It was renewed, and this happened two or three times. In the end the lump disappeared. These two cases stand out in my memory as the only disappearances of considerable lumps other than inflammatory deposits which I have personally observed. I believe they were both hæmatomas, though this was not proved by incision in either case.

As to the general aspects of the condition, little has been written; it is hardly mentioned in some textbooks and is treated briefly in others. Numerous cases have been in the medical journals, most of which would seem to be the results of strains and accidents in men of active habits—cavalry soldiers, acrobats, and others whose occupation or sport demands violent effort. In women, on the other hand, the lesion occurs, apart from obvious trauma, in those of middle or advanced age. It is sometimes associated with coughing or vomiting. In the cases I have mentioned the patients were all past the menopause. There was a history of a fall in one case and of a strain in another. Out of Cuthbertson's[1] forty-one cases, thirteen were over 50 years of age; seven were between 40 and 50; six were under 40. Twelve of the patients were pregnant or had recently been delivered.

Hæmatomata which simulate pelvic growths are below the umbilicus, and are thus due to the rupture of muscular branches of the deep epigastric artery. Being impressed by the marked lateral extension of the swelling in these cases I consulted Professor Stopford on the point. He says that if the hæmorrhage occurs below the fold of Douglas, owing to the formation of the sheath of the rectus at that level, there is nothing to prevent the lateral extravasation of blood deep to the aponeurosis of the oblique muscles. This explains the relatively limited character of hæmatomata higher up in the rectus muscles. The extravasation of blood cannot cross the linea alba, but the swelling can extend beyond the middle line by pushing the linea alba over toward the sound side of the body.

The most interesting thing about these cases is the diagnosis. The patient complains of pain and the medical man finds the swelling. The trouble is that he seldom knows how long the swelling has been present: for patients frequently have masses of various kinds in the pelvis or abdomen whose presence is not suspected until they complain and submit to examination. The main point is the recognition that these swellings are part and parcel of the abdominal wall. This is generally made by noting that they can still be felt when the recti are in action, and that they become fixed as the muscles contract. Another point is that, when a mass in the abdominal wall is not too large, a resonant note may be obtained right through it by deep percussion. But these signs are not infallible, for a mass within the abdomen that has become adherent to the wall gives the same signs as one which is a part of the wall. Even physical signs can tell lies, and must be checked.

This point decided, the next question is—What other swellings may be found in the wall of the abdomen? My first employment after qualification was to duty for the house-surgeon of a hospital in a country town. He called my attention to a girl with a so-called ovarian cyst who was being prepared for operation next morning. The girl told us that the swelling was there sometimes, but not always. It was cystic, in the mid-line, and reached just to the umbilicus. It was still felt, and was

fixed when the recti were in contraction. Being very young then, and full of book learning, I suggested that it might be a cyst of the urachus communicating with the bladder. Strange to say, it was, and we massaged the contents into the bladder and drew it off with a catheter.

A girl, aged 13, was brought to the Northern Hospital, Manchester, with a swelling above the pubes, which was part of the abdomnal wall. The mother had been told that it was a pregnant uterus, and when assured that this was not the case, took the child away. But later, the patient reached the Children's Hospital at Pendlebury, where the late Mr. Joseph Collier opened an abscess and found in the centre of it a rusty needle.

The commonest swellings in the abdominal wall are new growths—namely, those masses of spindle-celled tissue called desmoids. They are generally single, but I have seen three in the recti of one patient. Slow-growing and painless, they are easily recognized. They were frequently excised formerly, but they yield to treatment by irradiation in most cases.

Another new growth in the abdominal wall was seen in a patient from whom I had removed an ovarian cyst-adenoma six years previously. She came back, saying she had another tumour upon which her corsets pressed uncomfortably when she sat down. It was a solid encapsuled mass under the scar of the former operation, and, on section, its structure was that of the solid portions of a cystadenoma.

Thus, before completing the diagnosis of a hæmatoma, it is necessary to exclude new growths, inflammatory masses, and developmental errors; for they all produce swellings in the abdominal wall which simulate tumours of pelvic origin. As to treatment, a small hæmatoma in this position may doubtless be left alone. But should we wait for the larger ones to become infected before opening and emptying them? I think not. If the mass of blood-clot is of considerable size, the patient will be sound and well again much sooner under active surgical than under expectant treatment.

Reference

1. *Journ. Amer. Med. Assoc.*, December 19th, 1925.

Mr. W. W. King (Sheffield), related two cases in which rupture of a vessel in the abdominal parietes gave rise to acute symptoms; one of which simulated torsion of the pedicle of an ovarian cyst, and in the other caused continued pain of uncertain origin.

Case 1. An elderly woman, the subject of chronic bronchitis, sent for her doctor on account of acute, left-sided abdominal pain which followed a severe attack of vomiting. The presence of a tender swelling just above the left Poupart's ligament at first suggested a hernia. It rapidly increased in size; the patient became very ill and vomiting was copious; the bowels acted with an enema. Upon examination twelve hours later, a tumour the size of a five months' pregnancy could be seen and felt in the abdomen. This was taken to be an ovarian cyst with torsion of its pedicle, but pelvic examination showed that this was not the case. Upon exploratory laporotomy, the "tumour" proved to be a large hæmatoma lying between the rectus fascia and the peritoneum. The clot was evacuated and she made a good recovery.

Case 2. A woman of thirty-eight had an acute attack of epigastric pain and vomiting which subsequent events showed to have been due to pancreatic disease. The violent vomiting caused sudden pain in her left side, which persisted in a more-or-less acute form for three weeks, when she was sent to hospital. When seen there, it was possible to detect some "bruising" of the skin, which roughly followed the line of the deep epigastric vessels. In the middle of this a tender swelling could be felt, which, upon bimanual examination of the pelvis, could be felt to bulge into the peritoneal cavity. The diagnosis of rupture of a vessel—presumably the deep epigastric vein—in the abdominal wall was, therefore, sufficiently clear to admit of expectant treatment. In four weeks all tenderness and swelling had disappeared. While in hospital she had a second attack of epigastric pain associated with transient glycosuria, and marked tenderness and swelling of the pancreas; otherwise she made a good recovery.

CONJOINT MEETING OF THE GYNÆCOLOGICAL VISITING SOCIETY OF GREAT BRITAIN AND THE AMERICAN GYNÆCOLOGICAL CLUB.

A meeting of the above societies was held in Liverpool on 5th and 6th August, 1926, when the programme was as follows:—

August 5th, morning. Dr. Leith Murray operated at the Northern Hospital. Subtotal hysterectomy for fibroid uterus with ovarian dermoid cyst. Sub-total hysterectomy for fibroid uterus. Myomectomy.

Dr. Leyland Robinson operated at the Hospital for Women.—Exploratory laparotomy (inoperable ovarian carcinoma). Total hysterectomy with removal of both appendages for post-menopausal bleeding. Left ovariotomy for ovarian cyst, appendicectomy. Subtotal hysterectomy with removal of both appendages. Appendicectomy. For bilateral salpingo-oophoritis; fixed retroversion. Anterior colporrhaphy; amputation of cervix; posterior colpo-perineorrhaphy.

The American Gynæcological Club was entertained to luncheon at the Adelphi Hotel by the The Gynæcological Club.

Afternoon. Professor Blair Bell operated at the Royal Infirmary. Panhysterectomy for fibromyoma of uterus with extensive appendage and pelvic infection. Anterior hysterotomy for cochleate uterus. Cæsarean section (generally contracted pelvis). Anterior and posterior colporrhaphy and amputation of cervix for uterine and vaginal prolapse.

After the operations cases and specimens of carcinoma and syphilis of vulva were shown and discussed by Professor Blair Bell.

Evening. The Gynæcological Visiting Society entertained The American Gynæcological Club to dinner at the Adelphi Hotel.

August 6th, morning. Address by Professor Blair Bell on the Treatment of Cancer by Lead, given in the Lecture Theatre of the Obstetrical and Gynæcological Department at the University.

Professor Blair Bell described the organisation of which he is Director, calling special attention to the co-operative nature of the arrangements

for research. He mentioned that, at present, the whole organization is supported by the fees received from patients, every penny being handed over to the Committee.

He described the investigations that have been made, which go to show the similarity of cancer cells and the cells of the chorionic epithelium. The work accomplished in this direction covered morphological, chemical, physico-chemical, physiological, pathological and toxicological studies.

Some of the practical aspects of the subject in regard to the treatment of patients were considered, and questions of medical etiquette were mentioned.

Demonstration in the Muspratt Laboratory of Physical Chemistry, University of Liverpool, of the methods of preparation and physical characteristics of colloidal lead.

Cases were shown at the Royal Infirmary, illustrating malignant disease at different stages of treatment.

The Cancer Research Committee entertained the two societies to lunch at the Exchange Hotel.

Afternoon. Demonstrations of twenty-five cured and apparently cured patients at Northern Hospital, and the Cancer Research Committee's Private Hospitals. In the majority of these patients an operation has been refused by expert surgeons because the growth was deemed to be too advanced for operative treatment of a surgical nature three, four and even five years previously. A description of the technique and methods of injection of colloidal lead by Dr. Cunningham (Assistant Director of The Cancer Research Committee) closed the proceedings.

Evening. The American Gynæcological Club entertained The Gynæcological Visiting Society to dinner at he Adelphi Hotel.

The following members were present at this meeting :—

American Gynæcological Club :— Dr. J. Brettauer, Dr. J. Wesley Bovèe, Dr. W. E. Caldwell, Dr. Denforth, Dr. Robert L. Dickinson, Dr. N. Sproat Heaney, Dr. Barton Cooke Hirst, Dr. F. C. Holden, Dr. G. W. Kosmak, Dr. Herbert M. Little, Dr. Franklin H. Martin, Dr. C. Jeff Miller, Dr. Reuben Peterson, Dr. John O. Polak, Dr. Frank F. Simpson, Dr. Richard R. Smith, Dr. Howard C. Taylor, Dr. George Gray Ward.

Gynæcological Visiting Society :— Dr. Russell Andrews, Mr. Comyns Berkeley, Professor Blair Bell, Mr. Victor Bonney, Dr. Daniel Dougal, Dr. W. Gough, Dr. R. J. Johnstone, Dr. W. W. King, Dr. Cuthbert Lockyer, Professor C. G. Lowry, Sir Ewen Maclean, Dr. Farquhar Murray, Professor Carlton Oldfield, Mr. A. Leyland Robinson, Professor Fletcher Shaw, Dr. Gilbert Strachan, Professor Beckwith Whitehouse, Mr. Clifford White, Dr. James Young.

PROCEEDINGS OF THE COOMBE LYING-IN HOSPITAL CENTENARY GYNÆCOLOGICAL CONGRESS, 1926.

Presidential Address. By Sir William Smyly, M.D.

In his Presidential Address, at the opening of the Gynæcological Congress to celebrate the Centenary of the Coombe Lying-in Hospital, Dublin, Sir William Smyly paid tribute to the splendid work accomplished by the

past Masters of the Hospital, but no one, he added, had done more for the benefit of the Institution than the present Master, Dr. Louis Cassidy, to whose initiative and energy the Congress owed its success. Having spoken of the urgent need for improvement in the teaching of Midwifery, Sir William Smyly proceeded to welcome the distinguished visitors from England, America, Sweden, France, Austria and Germany.

OPENING ADDRESS.

Mr. Comyns Berkeley said that we should insist on a complete and thorough examination of the babies' eyes. It is asserted that if the eyes of newborn babies were thoroughly examined, injuries to the eyes as the result of labour would be found to be quite common. If this statement is true, its realisation is of the greatest importance. How many of the disabilities of the eyes which are commonly called congenital are due to injury in the process of labour? Also, if these disabilities had been recognized at the time of birth, could a defect which is now irremediable have been cured?

My own experience at the Middlesex Hospital and at the City of London Maternity Hospital, and in private practice, which covers some 30 years, has led to the belief that injuries to the eyes as the result of labour are extremely rare. I must admit that I have never examined the the eyes with an ophthalmescope, such a procedure presents many difficulties. I wonder what my ophthalmic colleagues at the Middlesex Hospital would say if I sent every baby born in our department for a complete examination, or I asked the consulting ophthalmic surgeon at the City of London Maternity Hospital to visit the hospital every week for a similar purpose, say 4000 or 5000 examinations a year; or would my private patients agreed to pay a fee for such examination?

Some of you may reply that such a drastic examination is unnecessary and that only in those cases in which the labour has been unduly prolonged or instrumental would the necessity arise, and I should have been inclined to agree with them, had I not been otherwise informed.

But we are met with this difficulty: if we are to believe those who have paid especial attention to this subject, injuries to the eyes occur in 20 per cent of apparently, and to all intents and purposes, normal labours.

Lequeux, in an investigation, within the first 24 hours of birth, states that he found a disturbance of some sort in the eyes of the babies in 25 per cent. of the cases, in this order: paralysis of the muscles, corneal leisons, retinal hæmorrhages. He examined 151 babies, and if such an experience is not accidental, if I may so term it, then it becomes almost alarming.

Paul records just as startling figures, he found retinal hæmorrhages in 50 per cent. of babies in contracted pelvis, 40 per cent. in premature births, 40 per cent. in non instrumental prolonged labours, 20 per cent. in normal cases.

I am aware of the various injuries that may occur, and of the circumstances in which they occur, and I also know how, in certain conditions such injuries may be prevented by an anticipation of difficult labour before it occurs and otherwise when one has had no opportunity for such anticipation of the great importance of care and intelligence in the performance of the necessary manœuvres to terminate the labour. Thus, that the eyelids may be lacerated, that contraction of the palpebral fissure, laceration of the lacrymal duct, exophthalmos, injury to the external rectus

muscle, luxation and avulsion of the eyeball, crushing of the eyeball, luxation of the lens, injuries to the cornea with resulting opacities, may be and have been due to pressure from the blade of the forceps.

I know that fracture of the skull or laceration of the tentorium may produce an intracranial hæmorrhage followed by ptosis of the upper eyelid, paralysis of the external rectus or a combined paralysis of the sixth and seventh nerves.

The injuries enumerated are doubtless in many cases, due to the unintelligent interpretation of the nature of the delay that has occurred in the birth of the child, to the incorrect methods that have been taken to overcome such difficulties and in the absence of skill in attempting to deal with them. But such injuries have also been caused when the child has been delivered by nature.

I know that the great congestion of the head and face which is sometimes apparent at the termination of a prolonged but otherwise normal labour, or which is present when the umbilical cord is coiled tightly round the neck may result in œdema of the lids, retrobulbar hæmatoma leading to exophthalmos, hæmorrhage into the anterior chamber or retinal hæmorrhage. I know that the attendant may seriously injure the cornea when making repeated vaginal examinations in an atttempt to diagnose a face or brow presentation and I understand from those who have studied the subject, that most cases of avulsion of the eyeball have been due to gross carelessness in such circumstances. I also know that fracture of the skull may involve an injury to the optic and other nerves on their course through foramina or fissures to the eyeball.

But the point I wish to make is this: that such injuries, with the exception of retinal hæmorrhages appear to those engaged in midwifery to be rare. In making this statement I am thinking, not only of people like myself, but of investigators who have made some study of the subject. Thus De Weeber in 200,000 deliveries reports 3 cases; True, in 40,000 deliveries reports 3 cases; Wolff in 39,317 deliveries reports 6 cases, as against this however:—Lequena in 151 deliveries reports 25 per cent. of injuries; Krigsten in 281 deliveries reports 10 per cent. of injuries; Luterer in 400 deliveries reports 10 per cent. of injuries; Schleich in 150 deliveries reports 32 per cent. of injuries; Paul in 200 deliveries reports 69 per cent. of injuries; and Nortelin in 150 deliveries reports 23 per cent. of injuries.

But obviously such figures could only have been obtained by the most complete examination, a large proportion of which must have revealed retinal hæmorrhage. Thus Paul found such a lesson in 32 per cent. of the babies he examined, and Schleich in 32. As I have remarked, I know how in many cases such injuries may be prevented but I was not asked to speak this evening on the methods that should be taken to prevent such injuries. This congress, I take it, is concerned, more particularly, with the care and treatment of disabilities of the eyes, and, as far as possible with prophylaxes, but hardly with the indications for and proper methods of treating contracted pelvis or with the indications for and the correct method of applying and using the forceps;or with the the treatment of uterine inertia. Even if you are disposed to listen to such details, I should have to ask your indulgence for several evenings.

If, as it is asserted, injuries to the eyes of babies during birth have been so common in the past I feel sure that because of the efficient

antenatal treatment which is existent in so many parts of England, these deplorable injuries must be getting fewer. For although it may be true, as some assert, that in 20 per cent. of normal births the eyes of the child are injured, yet in the majority of cases such injuries are associated with abnormal labour. Now the number of complications in labour due to disproportion between the pelvis of the mother and the head of the child is diminishing in a remarkable degree. At the antenatal centres and in private practice we anticipate the disadvantages of contracted pelvis by the timely indication of labour and by Cæsarean section, and our students are so much better trained that none of them have any excuse in not knowing when and how to apply the forceps.

This only leaves the Welfare Centres. At one centre that I know of, provision is made for the services of an expert in ophthalmology, except when the centre is situated in a general hospital, so that unless there is something obviously wrong with the child, serious injuries such as retinal hæmorrhages, pass unnoticed.

It may be that, as a result of this discussion, this meeting will pass some resolution dealing with the facts I have mentioned, recommending say, to the Ministry of Health, a closer expression, and I need hardly say say, to the Ministry of Health, a closer supervision, I shall feel that after all, I may have done some good.

OBSTETRICAL TEACHING IN SWEDEN.

By Professor Essen-Moller.

In Sweden, a young man who desires to study Medicine must count upon an average time of 8 or 9 years before passing his examination. The medical course of study is divided into two examinations, the first of which, the Intermediate Examination in Medicine, embraces only the theoretical subjects and requires from four to four and a half years. The second, the Licentiate of Medicine, comprises the clinical work and requires about the same time The undergraduate is not admitted to the Hospital before he has passed his first examination. Before passing the second examination a long period of clinical work is necessary. For surgery ten months, for internal medicine 11 months (the medicine and surgery can be carried out together for six months out of these 11), pediatrics three months ophthalmology two months, &c. Only a few of these clinical subjects can be combined. The clinical training in Obstetrics and Gynæcology last for four months and is undertaken generally in the sixth or seventh year. In Sweden, obstetrics and gynæcology are not separate courses of study but, constitute one subject. In the three university towns: Lund, Stockholm and Upsala, all the obstetrical and gynæcological cases are brought together in one hospital. The professor of obstetrics and gynæcology at the university is the chief surgeon and obstetrician. To facilitate his work, the clinic contains a special department for his private patients. In the university clinics, instruction is given to medical students only, and not to midwives. During the four months' course the student is resident at the clinic and cannot busy himself with work elsewhere. At the end of this period, each

student has conducted an average number of 30 o 40 normal labours, one or two abortions and perhaps one or two cases of twins, and has made about 60 gynæcological examinations. This figure could be larger, but for the fact that only one student is allowed to examine each patient.

This regulation of the obstetrical and gynæcological teaching has been in existence for more than half a century and has given every Swedish physician such a training in obstetrics that he can manage labour with safety and confidence.

In the discussion which followed, Prof. Couvelaire (Paris), Prof. Munro Kerr (Glasgow), Prof. Fletcher Shaw (Manchester), Mr. Comyns Berkeley (London), Dr. Fairbairn (London) and Prof. DeLee (Chicago) took part.

CINEMA DEMONSTRATION.

By Professors J. L. Faure and Couvelaire.

A very excellent film was shown by Professor Jean Louis Faure of Paris, demonstrating the details and technique of the operation of abdominal hysterectomy.

Another film was shown the next day, by Prof. Couvelaire, demonstrating the technique of the low Cæsarean operation, in which also the educational value of the cinema as a teaching instrument was fully displayed.

THE UNNECESSARY INDUCTION OF LABOUR.

By Eardley Holland.

Mr. Holland believes that induction of labour for pregnancy with contracted pelvis and for so-called prolongation of pregnancy is to-day being greatly overdone. The character of the second stage of labour is the best criterion as to the necessity.

A very searching analysis of the cases at the London Maternity Hospital was given, in which the case-records seemed to show that about 80 per cent. of the inductions for these two conditions were performed unnecessarily.

He entered a special plea to all teachers of obstetrics that they should insist that the only indication for inducing labour when pregnancy is prolonged is disproportion. All patients in whom the onset of labour is delayed should be regarded with suspicion and should be subjected to weekly examination and labour should be induced only when it is evident that the fœtus is becoming too large.

CLIMACTERIC AND PRE-CLIMACTERIC BLEEDINGS.

By Professor Paul Werner, Vienna.

Following the present tendency towards conservative methods rather than surgical, the treatment generally adopted at the Universitäts Frauenklinik, Vienna, for women over 40 years of age complaining of bleeding, either too profuse or too frequent, has been to bring about

amenorrhœa by means of X-rays. Whenever malignant disease was suspected, a test curettage was first done. Results were successful, but further improvements were desired, to preserve, if possible, the normal menstruation and the activities of the ovaries, lest the sudden bringing about of amenorrhœa should prove detrimental to the health of the patient. As a step in this direction, irradiation of the hypophysis with small doses was suggested. This treatment already proved successful for climacteric disturbances, giddiness, flushes, &c.

Up to the present, 53 cases of climacteric hæmorrhages have been treated in patients whose ages range from 38 to 55 years. They can be be grouped as follows :—

Group I. Those cases with too short intervals between the periods and a heavy loss of blood. 26 cases, with 20 cures and six unsatisfactory results.

Group II. Interval normal in length, loss of blood profuse. 17 cases. In nine cases a considerable diminution in the loss of blood was effected. eight cases remained unchanged.

Group III. Bleeding scanty, interval irregular and frequently prolonged. ten cases. In seven of these there was a successful result, with increased amount of blood and shortening of the interval to four weeks In three cases complete amenorrhœa resulted, but the distressing climacteric symptoms disappeared.

On considering these results, the maximum of success was achieved in group I where the bleeding was too heavy and too frequent. 70 per cent. were cured. The results in group II are less succsessful. On examining the refractive cases in this group, in each one the uterus was of abnormal size and hardness. The true cause of the condition was a myoma or an adenomyosis. In nearly all the failures in Group I the uterus was of abnormal size, suggesting a similar condition. In group III in the greater number of cases the bleeding was intensified, complete amenorrhœa only occurring now and then. Provided the treatment begins at the primary stage, the irradiation can stimulate the function of the inner secretory glands; if the change in the glands has progressed too far with involution of the uterus and mucous membrane it is not feasible to bring about regular menstruation. Successful results last for several months—in many cases up to one year.

THE LOWER UTERINE SEGMENT CÆSAREAN SECTION OPERATION.

By Professor Munro Kerr.

In recent years the approach to the interior of the uterus through the lower uterine segment has come into prominence, not because of its advantage in suspect and infected cases, but because in this area a sounder cicatrix can be secured. The investigations of Singer, of Couvelaire and of Eardley Holland have shown that with the incision in the contractile portion of the uterus there is a considerable proportion of cases where the scar is weak and not a few where the scar gives way at a subsequent pregnancy or labour.

The objects to the classical incision are :—

1. The uterine muscle fibres during the puerperium are in a state of degeneration.
2. The uterus is in a state of unrest, alternate contractions and relaxations are occurring during the early days of the puerperium, so that the sutures are disturbed and dragged upon.
3. The surgeon must use his sutures not only as coaptors but as hæmostatis agents.
4. The sheets of muscle fibres of the uterine wall are distributed irregularly so that it is impossible to coapt the muscle fibres exactly.
5. If the placenta is situated on the anterior wall, as occurs in 40 per cent. of cases the interior surface of the wound is very friable and contains large sinuses.

Fibrous tissue enters largely into the healed scar in the upper uterine segment of the uterus, an area which contains such a large proportion of muscle tissue.

Advantages of an incision in the lower uterine segment are :—

1. The uterine wall in this area is thin.
2. It contains relatively more fibrous tissue.
3. It is less vascular and there is little hæmorrhage during the operation.
4. It is quiescent after delivery.
5. In a subsequent labour it is not strained until labour has advanced.
6. In repeat operations the scar is generally invisible.
7. The wound can be completely covered by peritoneum.
8. By reason of the site and the fact that it can be covered by peritoneum it is safer in suspect and infected cases.

The disadvantages are :—

1. The lower uterine segment is often not well developed until labour has advanced.
2. When the head or pelvis of the child has descended into the pelvis of the mother it is unfavourable for this incision.
3. The operation is not so simple. This is no argument against its employment.

Details of the operation :—

The patient is placed in the Trendelenburg position. One-half cubic centimetre of pituitrin is injected into the triceps muscle to secure prompt contraction when the uterus is emptied. A longitudinal incision, about six inches in length is made through the abdominal wall in the middle line, the lower end just reaching the symphysis pubis. The lower end of the wound is then retracted over a protecting layer of gauze with a Doyen's retractor. The rest of the abdominal cavity is protected by packing off the upper portion of the operation area with gauze. A transverse incision is made through the uterine wall in the same region. When the centre of this incision is complete, a blunt-pointed bistoury is employed to extend it in either direction to the required degree. If the head is not easily accessible, pressure on the fundus through the abdominal wall often

brings the head into the wound. To avoid handling, especially in presumably infected cases, the head may be guided with one blade of short obstetric forceps and the delivery completed by pressure on the fundus. If this is insufficient, both blades are employed. The umbilical cord is ligated and divided in the usual way. A self-retaining retractor is now inserted to keep the sides of the abdominal wall apart. If the cervix is not well dilated, the placenta is delivered by compression of the fundus through the abdominal wall, and traction on the cord. An intramuscular injection of a sterile preparation of ergot is given at this stage. If the cervix, however, is well dilated, and this is a most important advantage in an infected case, the placental end of the cord is dropped back into the uterus, the placenta and membranes being expressed *per vias naturales* when the abdomen has been closed. By this means, intrauterine manipulations are reduced to a minimum. The edges of the uterine wound are now picked up with fine tissue forceps or temporary silk ligatures. The mucous membrane, with the innermost portion of the muscle coat, is sutured with a continuous No. 1 chromic gut suture, the edges of the mucous membrane being directed inward toward the uterine cavity. The remainder of the muscle coat is carefully approximated and sutured with a continuous No. 2 or No. 3 chromic gut suture. Great care must be taken to secure completely the lateral extremities of the incision. The peritoneum over the uterus is closed with a continuous No. 1 or No. 0 catgut suture, the operation area being completely shut off. The gauze packing is removed and the abdominal wall carefully closed in layers. The surface of the wound is secured with an anchored dressing.

The following is a brief survey of results in a series of 107 cases of Lower Uterine Segment incision :—

Cases	*Total*	*Maternity Mortality*	*Percentages*
"Clean"	82	0	0
"Doubtful"	25	4	16

Fœtal mortality nil.

A series of repeat operations gave the following results :—

Second Cæsarean section of the lower uterine segment type ...	17
Second Cæsarean section of the classical type	6
Spontaneous delivery of a smaller child	2
"Low Forceps"	1

Fœtal mortality nil.

In only one repeat operation was there any thinning of the scar and that was slight and at the angle of the scar.

Dr. Munro Kerr's paper was discussed by the following : Couvelaire, De Lee, Essen Moller, Eardley Holland, Werner.

A Short Historical Note on an Important Advance in Obstetrics with Remarks on Antiseptics and Asepsis in the Private Practice of Midwifery.

By Professor Archibald Donald.

Towards the end of the 18th and beginning of the 19th Century, the existing maternity hospitals were deservedly unpopular, owing to the constant outbreaks of puerperal fever. In some hospitals the maternal

mortality rose as high as 1 in 20. The earliest antiseptic introduced into midwifery practice was a dilute solution of carbolic acid and it served its purpose in showing that the use of an antiseptic exercised a favourable influence in reducing puerperal mortality. In 1884 a further step in advance was made when solutions of biniodide and perchloride of mercury became the routine lotions for the maternity hospitals throughout the world. Cases of mercurial poisoning became common as the solutions were frequently used to douche both uterus and vagina. The introduction of the aseptic system into hospitals was the next great advance. In private practice, unfortunately the incidence of puerperal sepsis remains much the same to-day as it was 30 years ago.

Professor Donald laid down three simple rules as essentials in general practice :—

1. The thorough cleansing of the hands and arms of the attendants and their disinfection in perchloride or biniodide of mercury solution for three minutes. If gloves are used they should be rinsed repeatedly in the disinfectant solution.
2. The disinfection of the patient's perinæum and vulva by washing, shaving and swabbing with perchloride or biniodide solution.
3. The protection of the perinæum and lower part of the vagina by applying a sterilised pad after parturition and the careful cleansing of even the smallest perineal tear each time this pad is changed.

Professor Donald regards the theory of endogenous infection as a dangerous one, and says that it is better to hold that in all cases infection comes from outside. The occurrence of sepsis is in inverse ratio to the precautions observed.

THE PATHOGENICITY OF PARTURITION.

By Professor J. B. De Lee, Chicago.

Professor De Lee stated his firm conviction that the function of child-bearing in the modern civilized woman is a distinctly pathological process. The incompatibility of the fœtal and maternal bloods may have its origin in far distant fusion of alien racial strains. Mixed breeding causes a high obstetric mortality and morbidity. The pregnant woman is in a state of physiological inferiority which shows itself in toxæmia,, hyperemesis gravidarum, eclampsia, abruptio placentæ, an in a minor degree in sleepiness, malaise, aches and pains, fainting spells, etc. Pregnancy creates a weakness against infections, for example against influenza, an increased vulnerability to the evil effects of tuberculosis and heart disease and an increased tendency to disturbance of the endocrinal gland balance.. Further, civilisation has caused fundamental alterations in the mother and child which combine to render the act of parturition laborious, harmful and even life-destroying. Constitutional variations produced by climate, diet, dress and disease, may lead to the production of misshapen pelves, weakness of the abdominal and uterine muscles, undevelopment of the ligamentary supports of the pelvis and viscera and insufficiency of the nervous endowment so vital for a successful labour.

In the U.S.A., 20,000 women die each year during child-birth. In addition, 50 per cent. of the women who have children carry the wounds upon them and sooner or later will suffer from the effects, laceration of the cervix or of the support of the uterus, bladder, vagina, perinæum etc.

As regards the child, about 100,000 babies die each year in the U.S.A during or shortly after birth. The baby runs a long gauntlet of perils on its way into the world, and owing to the compression and moulding of the head, runs the chances of cerebral hæmorrhage, or compression distortion and congestion of the brain. Neurologists emphasise the connection between epilepsy, idiocy, cerebral palsies, and prolonged hard labours. As long as the function of child-birth is proclaimed a normal process it will never obtain the respect it merits and without which it will not be possible to effect much improvement in public and professional attitude towards obstetrics.

ECLAMPSIA.

By Professor Hinselmann.

For simple cases of hydrops, where there is œdema of the body tissues, without albuminuria or high blood pressure, Professor Hinselmann advises keeping the patients in bed for some days and limiting their nourishment to one litre or one kilo diem. Later, the patient can resume her occupation provided she keeps on low diet, not exceeding 1½ litres, and no salt. She should lie down for 20 minutes several times daily and for greater safety take one or two days rest with severe diet restriction each week. In spite of precautions, some cases increase in severity, slight albuminuria appears and the blood pressure rises to over 120 mm. Hg. Treatment is not changed except that the weekly rest days and low diet are now absolutely imperative. When albuminuria increases and the blood pressure rises higher the cases should be admitted to hospital. By rest in bed and starvation for one or two days an improvement is usually effected. After that, nourishment should be restricted to to about one litre. With a high blood pressure, venesection causes temporary improvement. It is best to keep the patient in hospital until parturition and it must be remembered that the condition can only be improved, not cured, during pregnancy.

Professor Hinselmann places great stress on the condition of the small vessels and capillaries in eclamptic conditions. Before treatment there is ectasia of the smaller vessels, the blood is bluish and moves interruptedly. The interruptions are due to contractions in the walls of the small vessels, especially of the arterioles. On this account, the blood cannot circulate freely and the peripheral resistance is increased. The blood pressure varies proportionately to the amount of the angiospasm. When labour comes on the angiospasm and resulting hypertonia are greatly increased during the pains. The brain is the last part affected. Increased venous pressure and œdema are most marked below the level of the heart, and were the brain to be where the kidneys lie, convulsions would be the first symptom instead of albuminuria. Death from eclampsia seldom occurs before the onset of convulsions. Life is endangered by convulsions because the heart is overtaxed, therefore convulsions may be allowed to remain as long as the heart keeps up its

strength. That is why it is sometimes better to allow one or two convulsions to occur rather than resort to different operative interference in the last stage of birth. On the other hand, if the heart shows signs of weakening, delivery must be accomplished at once. In many cases the most gentle method is by Cæsarean section. It is advisable to strengthen the heart beforhand with $\frac{3}{4}$ mgm. doses of strophanthin intravenously. If convulsions occur after delivery narcosis must be prolonged.

To sum up, eclampsaia is caused by a profoundly altered peripheral circulation; the associated anatomical changes can be accounted for by the ectasia of the vessels, the high blood pressure, the slow current of the blood and the angiospasm.

Dr. Beckwith Whitehouse read a paper on Dysmenorrhœa, see (p. 607).

SOME PROBLEMS IN THE DIAGNOSIS AND PROGNOSIS OF ANTE-NATAL WORK. THE VALUE OF X-RAYS AS A MEANS OF DIAGNOSIS.

PROFESSOR LOUIS MCILROY.

Out of the wide field of ante-natal diagnosis and treatment, Professor McIlroy dealt especially with :— 1. Breech Presentation; 2. Transverse Presentation; 3. Twins.

1. Breech presentation. Out of 2000 consecutive ante-natal cases there were 600 that had at some time been breech. Over 400 had spontaneously turned. This spontaneous version took place between the 30th and the 34th week. Version is therefore unnecessary before the 36th week. The dangers of version are a premature onset of labour, stoppage of the fœtal heart, and strangulation of the cord. An X-ray plate is of great assistance in showing cases where extension of the limbs makes version difficult. difficult.

2. Transverse presentation, owing to ante-natal work, is not regarded with the same apprehension as formerly. It really means a breech presentation turning to vertex. If a transverse presentation will not turn the outlook is serious and Cæsarean section should be done.

3. In the diagnosis of twins the X-ray often lends valuable assistance.

Professor McIlroy's paper was illustrated by X-ray plates of the various conditions mentioned.

"NECHEBT"—The Patron Goddess of the King.

In Pregnancy and Lactation

THERE are many reasons for the widespread use of "Ovaltine" in the diet of maternity. Physicians the world over recognise its value not only as an effective means of promoting the flow and quality of the milk of the nursing mother but as a form of nutriment ideally adapted to the prenatal requirements.

"Ovaltine" has a marked galactagogue action attributed to its richness in maltose and the other food principles having specific galactagogue qualities and also to the fact that these principles are almost completely absorbed with minimum digestive disturbance. The use of "Ovaltine," commenced during the later stages of gestation and continued throughout the nursing period, materially aids in promoting the general health of the mother, enabling her to withstand the extra strain imposed upon the system.

OVALTINE

TONIC FOOD BEVERAGE

For similar reasons "Ovaltine" is a valuable adjunct to the diet during the whole period of pregnancy. It counteracts any tendency to constipation and in cases of vomiting clinical experience has shown that it is well retained when ordinary forms of nourishment are rejected by the patient.

"Ovaltine" is taken as a delicious beverage which can be prepared at a moment's notice without bother, mess or trouble of any kind.

A liberal supply for clinical trial sent free on request.

A. WANDER LTD., 184, Queen's Gate, S.W.7.

Laboratories & Works: King's Langley, Herts.

M.217.

Printed by SHERRATT & HUGHES, 34, Cross Street, Manchester

Valentine's Meat-Juice

In **Typhoid, Gastric** and **Other Fevers** when the **Digestive Organs** are **Impaired** and it is **Imperative** to **Sustain** the **Patient, Valentine's Meat-Juice** demonstrates its **Ease** of **Assimilation** and **Power** of **Restoring** and **Strengthening.**

VALENTINE'S PREPARATION
VOLUME 1½ OZ.
MEAT JUICE
DIRECTIONS. Dissolve one teaspoonful of the Preparation in three tablespoonfuls of cold or warm water; boiling water changes the character of the preparation.

J. R. Wood, M. D., *Physician Sheltering Arms Hospital, Paint Creek, W. Va., U. S. A.:* "I have been using VALENTINE'S MEAT-JUICE in the treatment of Typhoid Fever cases in the Sheltering Arms Hospital, for the last two or three weeks, with the most gratifying results, both to the patient and physician. I consider it the best preparation of animal food I have ever seen, in fact, the only one I have ever had any success with."

C. R. Trippe, M. D., *Easton, Maryland, U. S. A.:* "The VALENTINE'S MEAT-JUICE came at a very opportune time, for shortly after I received a very severe accident to my knee from which I had Traumatic Fever for three weeks and could eat nothing, not even milk. I had often prescribed it, but had no idea of its real merit until I used it myself. I lived upon it for at least a week and not only found it very nourishing but very pleasant to take, in fact, was anxious for the time to come to take it."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,
DS RICHMOND, VIRGINIA, U. S. A.

Telephone: MUSEUM 3030. Telegraphic Address: "BRAWOODINE, EUSROAD, LONDON."
Close to Euston Square Station (Met. Ry.)

A. E. BRAID & CO., Ltd.

(Opposite University College.)

30, Gower Place, Gower Street, LONDON, W.C. 1.

Contractors to the Admiralty, H.M. War Office, India Office, Belgian Government and London County Council.

Sole Agents for the

'STERLING' Rubber Gloves

(Manufactured in Canada).

STERLING RUBBER COMPANY LIMITED · S · GUELPH · CANADA
REGD TRADE MARK

Made of the highest grade rubber of uniform thickness and perfect shape. Fully guaranteed. The results of numerous tests show their superiority after many sterilizations.

FIRM GRIP, MEDIUM WEIGHT	**3/- per pair**
SMOOTH, MEDIUM WEIGHT...	**2/6 per pair**

Special Terms for Quantities on application.

Chocolate Post Mortem Gloves	**4/6 per pair**
Obstetric Gloves with Gauntlets...	**9/- per pair**
Reinforced Finger Cots in envelopes	**15/- per grs.**
Tissue " " " "	**12/6 per grs.**
" " " " **wooden boxes**	**13/6 per grs.**
Diagnostic Finger Stall, One Finger with Flange ...	**20/- per doz.**
" " " **Two** " " " ...	**24/- per doz.**

We are exhibiting at the **"BRITISH EMPIRE EXHIBITION," WEMBLEY,** Canadian Section, Stand No. 23, representing all the **"STERLING RUBBER COMPANY'S PRODUCTS."**